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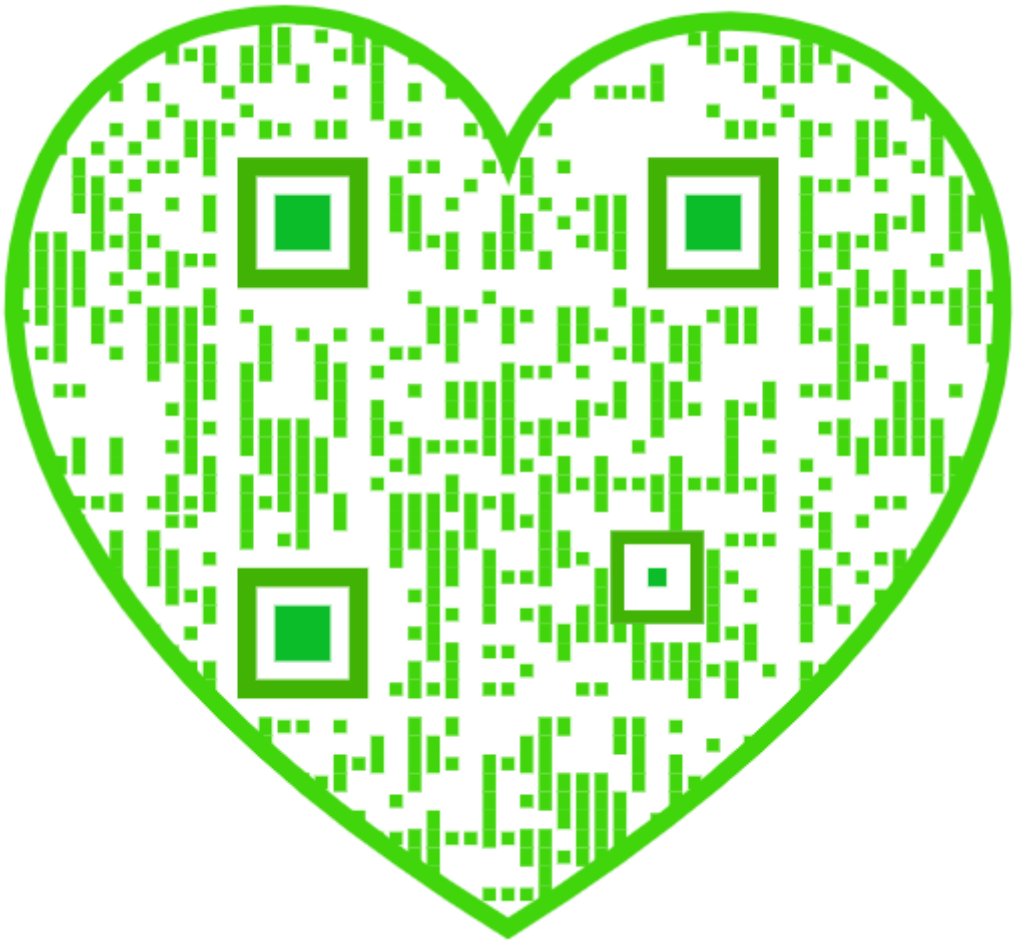

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PLATE I.

Chancroids of Anus and Vulva.

H. BENCKE, LITH. N.Y.

DISEASES

OF THE

RECTUM AND ANUS

THEIR PATHOLOGY, DIAGNOSIS, AND TREATMENT

BY

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THIRD EDITION, REWRITTEN AND ENLARGED

WITH TWO CHROMO-LITHOGRAPHS AND ONE HUNDRED AND SIXTY-EIGHT ILLUSTRATIONS

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PREFACE.

THE great advances which have been made during the past few years in the surgery of the rectum and intestinal surgery generally, have necessitated many changes in this, the third edition of this book. The chapters on the treatment of stricture both benign and malignant, and on the formation and closure of artificial anus, have therefore been entirely rewritten, and much new matter has been added.

The attempt has also been made by the addition of numerous illustrations, and by clear and definite descriptions, to supply the general practitioner with a safe guide for the performance of all the operations called for in the diseases of the rectum.

CHAS. B. KELSEY.

25 MADISON AVE., NEW YORK, 1890.

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DISEASES

OF THE

RECTUM AND ANUS.

CHAPTER I.

PRACTICAL POINTS IN ANATOMY AND PHYSIOLOGY.

THE rectum is the terminal portion of the large intestine extending from the sigmoid flexure to the anus. In its natural position its length varies in different persons from six to eight inches. When dissected out of the body and straightened, it will be found to measure about two inches more. Its position in the true pelvis is comparatively fixed, and its fixity renders it the more liable to those displacements, such as invagination and prolapse, which are due to straining at stool; and accounts also for the fact that, when denuded by the destruction of the surrounding cellular tissue, it remains separated from the walls of the pelvis, and cannot come in contact with the adjacent soft parts and thus undergo healing.

The upper limit of the rectum is difficult to determine with accuracy, except from the fact that it is separated from the sigmoid flexure by a slight constriction which becomes more apparent when attempts are made at dilatation. From this upper point it gradually expands below into a pouch, the ampulla, and then again suddenly contracts under the grasp of the muscles which close its lower end.

Curves.—The curves of the rectum are exceedingly important in a practical point of view. There are two, one antero-posterior, the other lateral. The former is double. From above downward it follows the curve of the sacrum and coccyx, being concave in front and convex behind. When it reaches a point

opposite the tip of the coccyx, it suddenly reverses its direction, turns sharply backward, and ends at the anus about one inch in front of the tip of that bone.

By this backward curve of its lower end, which is represented in an exaggerated form in Fig. 1, it is separated from the vagina in the female, and from the urethra in the male, by a triangular space having its base at the perineum, its upper wall at the vagina or urethra, and its lower at the upper wall of the rectum. The angle of junction of these two curves is well marked, measuring from twenty to thirty degrees; and the curve is not without influence in the function of defecation,

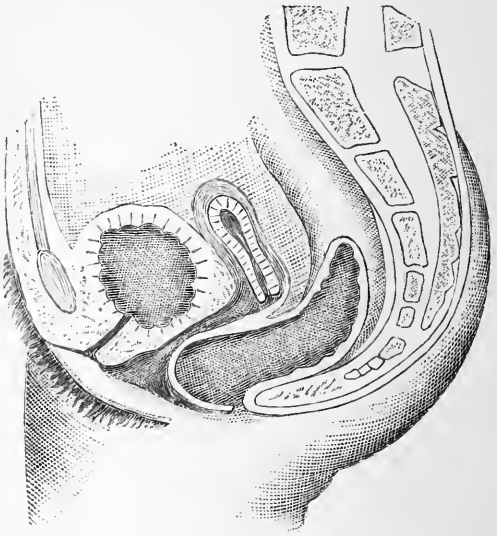

Fig. 1.—Exaggerated Antero-posterior Curve of the Rectum.

since, by it, an obstruction is formed to the downward course of the fæces.

The lateral curve is generally a single one from left to right, starting at the left sacro-iliac synchondrosis and ending at the median line at a point opposite the third sacral vertebra, from which point it generally passes straight on to the anus. This curve may, however, pass beyond the median line to the right in its lower portion, and again return to the median line at the anus. It is subject to many variations, and the upper portion may be more or less twisted on itself like the sigmoid flexure.

The sigmoid flexure may occupy an unnatural position, and the rectum, instead of commencing at the left sacro-iliac junc-

tion and curving toward the right, may commence at the right and curve toward the left. In one case, reported by Cruveilhier,[1] where the sigmoid flexure was in the natural position, the rectum passed almost transversely to the right side as far as the right sacro-iliac junction, and then returned again very obliquely to the left side.

Divisions.—For convenience of description the rectum is usually divided into three portions, named first, second, and third, from above downward. The third extends from the anus to the tip of the prostate, is about an inch and a half long, is firmly closed by the sphincters, and gives attachment to a portion of the levator ani muscle. On account of the direction of this portion, which is the reverse of that next above, the finger should never be passed toward the sacrum, or even directly inward, in making an examination; but rather toward the pubes. Bearing this simple anatomical point in mind will often save the patient much unnecessary suffering. The second portion is often described as reaching from the apex of the prostate to the recto-vesical fold of peritoneum; but, as the point of duplicature of the peritoneum is not only variable in different individuals, but at different times in the same individual, it is better to adopt a fixed bony point, as the third piece of the sacrum; in which case the middle portion will measure about three inches in length. This portion, it will be remembered, is convex backward, following the curve of the sacrum. The first portion extends from the third sacral vertebra to the left sacro-iliac synchondrosis; its lower part is partially, and its upper completely, surrounded by peritoneum, which, in the upper part, forms the meso-rectum attaching it to the sacrum.

NOTE.—Treves ("The Anatomy of the Intestinal Canal," etc., 1885), as the result of one hundred dissections, denies this arrangement of the first or upper part of the rectum. He says: "The segments of gut termed the sigmoid flexure and the first part of the rectum form together a single simple loop that cannot be divided into parts. This loop begins where the descending colon ends, and ends at the commencement of the so-called second piece of the rectum—at the spot, in fact, where the meso-rectum ceases, opposite about the third piece of the sacrum. This loop when unfolded describes a figure that, if it must be compared to a letter, may well be compared to the capital Omega. If at any time new terms should be introduced, it might be well to call all that segment of the bowel between the ending of the descending colon and the ending of the meso-rectum the omega loop, and to limit the term 'rectum' to the short piece of practically straight gut that is now described as the second and third parts of the rectum."

Relations.—The most important surgical relations of the rec-

[1] "Anat. Path.," Amer. Edition, 1844, p. 377.

tum are on the anterior surface. The third portion is surrounded laterally and posteriorly by a bed of connective tissue rich in fat and blood vessels, and may, therefore, be incised on either side, or backward, with comparative safety. In front, however, it is directly in relation with the membranous urethra in the male, and with the vagina in the female; though at the anus it is separated from them both by its backward and downward course. This intimate relationship with the urethra is often taken advantage of in catheterism, when by passing the finger into the rectum the tip of the instrument may easily be felt; and it also explains why in all operations on the urethra or vagina the rectum should first be emptied to save it from being wounded.

In the second portion, also, the lateral and posterior surfaces have no special surgical relations; while the anterior is in direct contact with the prostate, the base of the bladder, the seminal vesicles, and sometimes, at its upper limit, with the peritoneal fold of Douglas. This portion is closely connected with the bladder in the male, and with the vagina in the female, by connective and muscular tissue; and the two cavities may easily be made to communicate by any morbid process or by a surgical procedure. It was at this point that the trocar was plunged from the rectum into the bladder in the old operation of puncturing the bladder through the rectum; and Hyrtl[1] speaks of a man who was only able to pass his water after first introducing his finger into the rectum and raising a calculus out of the trigone of the bladder. A somewhat analogous case is reported in which a long, slender calculus perforated the bladder and projected into the rectum, from which it was easily removed.[2] The prostate, when large, may project over the sides of the rectum, or the latter may receive the prostate in a groove on its upper surface.

The first, or upper portion, unlike the other two, has important surgical relations on every side. Posteriorly it is in whole or part covered with peritoneum, and is separated from the sacrum by the pyriformis muscle, the sacral plexus of nerves, and the branches of the internal iliac artery. On its sides it is in contact with the adjacent convolutions of small intestine, and lower down, with the levator ani muscle and the connective tissue of the ischio-rectal fossa. In the male it is in relation, in front, with the posterior surface of the bladder, from which it

[1] "Topog. Anat.," ii., p. 103.

[2] Gooch: "Chirurg. Works," London, 1792, vol. iii., p. 216.

is separated by coils of small intestine. In cases of retention, either of urine or fæces, the two may be brought into actual contact. In the female it is in relation, anteriorly, with the broad ligament, the left ovary and Fallopian tube, the uterus and vagina. When the rectum and uterus are empty, the coils of small intestine pass down between them to the bottom of the fold of Douglas, and they may even escape through the posterior wall of the vagina in case of injury.

From these relations it is apparent that enlargements and malpositions of the uterus must act directly upon the rectum.

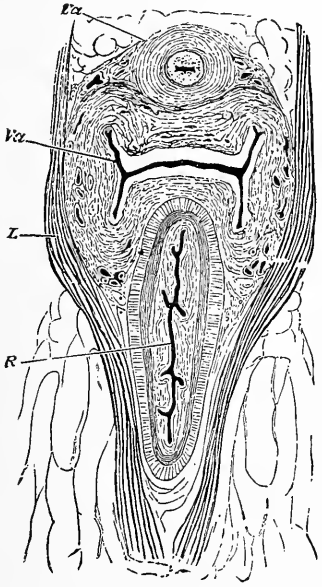

Fig. 2.—(After Henle.) Horizontal Section through Urethra, Vagina, and Anus. (The anus considered as about an inch long, and including the terminal portion of the rectum.)

The vessels may be so obstructed by uterine disease as to cause hæmorrhoidal troubles, or interfere with operations for their relief. The rectum may be entirely occluded by the pressure of a uterine tumor; and a hasty examination of the rectum may lead to the diagnosis of a tumor in its anterior wall, when in reality the normal uterus alone is felt. The advantage of a rectal examination in all doubtful cases of pelvic disease is also manifest.

The Anus.—The rectum terminates below in the anus, which is tightly closed by the external sphincter muscle. The skin around its border is thin and pigmented, covered with fine hair

in the male, and contains a great number of sebaceous follicles and muciparous glands. The skin passes deeply into the anal orifice, and its point of junction with the mucous membrane is in some persons indicated by an indistinct white line.[1] This white line of junction also corresponds to the division between the external and internal sphincter muscles; and also to the point at which many of the terminal filaments of the internal pudic nerve perforate the gut. Both skin and mucous membrane at the anus are remarkable for the development of erectile tissue; the arteries coming from the inferior hæmorrhoidal, and the veins being very numerous, winding, and twisted.

After these general considerations of the position and relations of the rectum as a whole, the individual parts may be taken up more in detail. The rectal wall is composed, as are the other parts of the intestine, of four layers: an external or peritoneal; a muscular, divided into longitudinal and circular; a submucous connective tissue layer; and, most internally, the mucous membrane. The total thickness of these coats collectively varies greatly in different subjects, the variation being chiefly in the muscular coat, the others remaining pretty constantly of the same thickness.

Peritoneum.—The upper portion of the rectum is entirely surrounded by peritoneum, and has, besides, a fold of attachment to the anterior face of the sacrum, known as the meso-rectum. The meso-rectum is about four inches long, blends with the meso-colon above, and extends down as low as the third or fourth sacral vertebra, from which point its two layers are reflected over the sides and anterior surface of the rectum on to the posterior wall of the uterus and upper limit of the vagina in the female; and upon the bladder in the male, forming the *cul-de-sac* of Douglas. The meso-rectum may be so short as to disappear when the rectum is distended, or it may be entirely absent; in which case the peritoneum passes directly from the sides of the rectum to the sacrum. Between its two layers may be found some loose connective tissue, the hæmorrhoidal vessels and nerves, and the lymphatics.

In passing from the third piece of the sacrum behind to form the *cul-de-sac* in front, the peritoneum covers more or less of the lateral and anterior surfaces of the middle portion of the rectum. As before mentioned, the point at which the peritoneum leaves the anterior surface of the middle portion of the rectum, to be reflected upon the posterior surface of the bladder in the

[1] Hilton: "Rest and Pain."

male, or of the vagina or uterus in the female, varies in different subjects, and at different times in the same subject; and hence the differences in its distance from the anus as given in different works on anatomy. In new-born children the bottom of the *cul-de-sac* touches the upper edge of the prostate and approaches to within about an inch of the anus. At five years it rises in the pelvis with the development of the seminal vesicles and internal organs of generation; and in old people with enlargement of the prostate it is carried still higher. In women it generally covers the upper part of the posterior vaginal wall, so that the latter is separated from the rectum by peritoneum for about one-third of an inch. By every expansion of the bladder or rectum, as well as by tumors of the pelvis, the fold is carried further away from the anus, as may easily be demonstrated on the cadaver by forcible injections of the bladder.

The average distance from the anus to the point at which the serous coat leaves the anterior wall of the rectum is, therefore, very difficult to determine. Dupuytren gives the distance as seventy mm., and less when the organs are empty; Lisfranc gives six inches in the female, and four in the male, but does not state in what condition of the organs the measurements are taken; Sappey, Velpeau, and Legendre give five and a half cm. when the bladder is empty and eight when distended; Quain says four inches; Allingham from two to five or more. Cripps,[1] acting on the idea that the fold is not easily displaced downward by traction on the rectum, has experimented by filling the peritoneal cavity with plaster, and then thrusting a needle through the skin of the perineum till its point struck the plaster. In this way he has obtained an average measurement of two and a half inches when the bladder and rectum are both empty, and an additional inch when distended.[2]

Muscular Coat.—In the fact that the muscular coat is arranged in two layers, an external longitudinal and an internal circular, the rectum resembles the other portions of the alimentary canal; but in the further arrangement of its fibres it resembles the œsophagus more closely than the intermediate portions. The fibres are spread out into two uniform layers, and are not

[1] "Cancer of the Rectum," London, 1880, p. 129.

[2] The following authors give the following measurements: Malgaigne, males, 6–8 cm.; females, 4–6 cm. Luschka, 5.5–8 cm. Hyrtl, 8 cm. Lisfranc and Sanson, 11 cm. Richet, males, 10.8 cm.; females, 16.2 cm. Blaudin, males, 8.1 cm.; females, 4.1 cm. Ferguson, males, 10.5 cm.; females, 15.4 cm. Esmarch: "Die Krankheiten des Mastdarms und des Afters." Pitha u. Billroth: "Chirurgie," p. 7.

arranged in bands crossing each other in basket network and leaving sacculi between the meshes as in the large intestine.

The longitudinal fibres are the direct continuation of the three longitudinal bands of the large intestine. Upon reaching the rectum, these blend into one continuous sheath which, however, is somewhat heavier on the anterior surface of the bowel than on any other. At the point of contact of the rectum with the bladder and prostate, these fibres are in part reflected with the peritoneum on to the posterior wall of the latter, and thus form a firm band of union between the two organs, as has been particularly described by Dr. Garson.[1] They have been named by him the recto-vesical fibres, but I have never been able to establish the fact of their existence.

The ending of the longitudinal fibres is worthy of note. According to Horner,[2] when they reach the lower margin of the internal sphincter a part of them turn upward between it and the external sphincter, and ascend for an inch or two in contact with the mucous coat, into which they are finally inserted; having, therefore, an obvious influence in causing protrusion of the mucous membrane. In the lower fourth of their extent, these fibres become weaker and less distinct, and some of them finally blend into elastic tendinous tissue which passes between the bundles of the external sphincter, and is inserted into the subcutaneous connective tissue of the anus. Others are inserted posteriorly, by means of an elastic tendon about an inch long, into the anterior sacro-coccygeal ligament—an arrangement pointed out by Luschka[3] as analogous to what is found in most mammalia, in whom a considerable number of the longitudinal fibres are inserted into the base of the coccyx, giving a fixed point for the rectum in defecation.

The circular layer is reinforced at certain points, notably at the internal sphincter, which is merely a collection of these fibres, and at a point higher up where they are again gathered into a bundle either partly or completely surrounding the bowel, known as the third sphincter. This supposed muscle will be described more fully later.

Submucous Coat.—The submucous tissue forming the bed upon which the mucous membrane rests is sufficiently lax to

[1] "The Arrangement and Distribution of the Muscular Fibres of the Rectum." Paper read before the Brit. Med. Assoc. Reported in Brit. Med. Jour., September 6th, 1879.

[2] "A Treatise on Special and General Anatomy," vol. ii., p. 40, Philadelphia, 1826.

[3] "Anat. des Menschen," vol. ii., part 2, p. 208.

permit of considerable sliding of the mucous membrane on the muscular coat. In it the blood vessels ramify, and from it perpendicular processes are given off which perforate both the internal and external muscular layers and are finally lost in the sheaths of the muscular fibres, or go entirely through the muscular layer and blend with the fibrous stroma of the surrounding fatty tissue. These processes from the submucous tissue, together with the lymph and blood vessels, serve to bind the various layers of the rectal wall together.[1] (Fig. 3.)

Mucous Membrane.—The mucous membrane of the rectum corresponds in its general characters with that of the other parts of the bowel, being modified, however, in certain particulars to suit its location and function. Its thickness is about three-quarters of a mm.; it is redder and more vascular than that of other parts of the large intestine; it glides freely on the

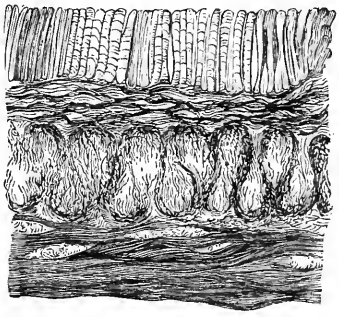

Fig. 3.—Section of the Normal Rectal Wall. (Cripps.)

tissue beneath, and is so ample as to be gathered into folds at various points, which are of considerable surgical and anatomical interest. At its point of union with the skin of the anus, it is gathered into vertical folds which diminish when the bowel is distended, but do not entirely disappear, and hence are not due solely to the contraction of the sphincter. These vertical folds have received the name of *columnæ recti*, or columns of Morgagni; and Treitz states that they contain bands of muscular fibres running longitudinally and terminating above and below in elastic tissue. Kohlrausch[2] also describes a thin layer of longitudinal muscular fibres under the mucous membrane at this point, and has named it the *sustentator tunicæ mucosæ;*

[1] Cripps, op. cit., p. 38.

[2] "Anat. u. Physiol. der Beckenorgane," Leipzig, 1854. Boyer also says they are strengthened by muscular fibres: "Traité d'Anat.," t. iv., Paris, 1815.

but most anatomists, with Henle, have failed to find anything more than the stratum of muscular tissue common to the whole mucous coat, and known as the *muscularis mucosæ*.

Between the lower ends of the *columnæ recti* little arches are sometimes stretched from one to the other, forming pouches

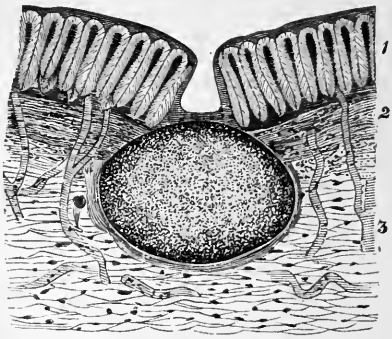

Fig. 4.—Section of the Rectal Mucous Membrane. (Esmarch.) 1, Follicles of Lieberkuhn. 2, Muscular layer of mucous membrane. 3, Submucous connective tissue and vessels, with a solitary closed follicle, over which the tubular follicles are wanting.

of skin and mucous membrane. These are more developed in old people, and may retain small pieces of hardened fæces or foreign bodies in their cavities, which are directed upward, and thus give rise to suppuration and abscess.

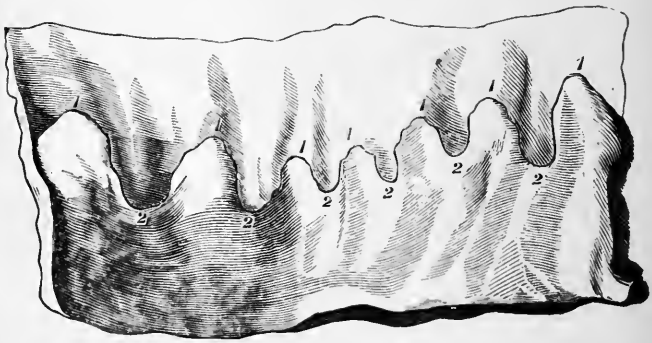

Fig. 5.—1, Ani columnæ; 2, Interjectæ iisdem valvulæ semilunares. (Morgagni.)

These little pouches, or sacculi, have quite recently been brought into rather an undue prominence by the attempts of certain charlatans to locate in them many of the causes of rectal disease. They have always been known to anatomists, as Figures 5 and 6 will prove (Fig. 5 from Morgagni and Fig. 6

from Horner). But the fact is that both these drawings, and more especially the first one, are diagrammatic exaggerations for the sake of clearness.

For some years I have been on the watch for these pouches in my rectal examinations, with the result of concluding that they do not generally exist to any such degree as these diagrams would indicate; and that, even when one or two of them are found, they are, in the majority of cases, of no pathological significance. I have slit them up on a director, sometimes two

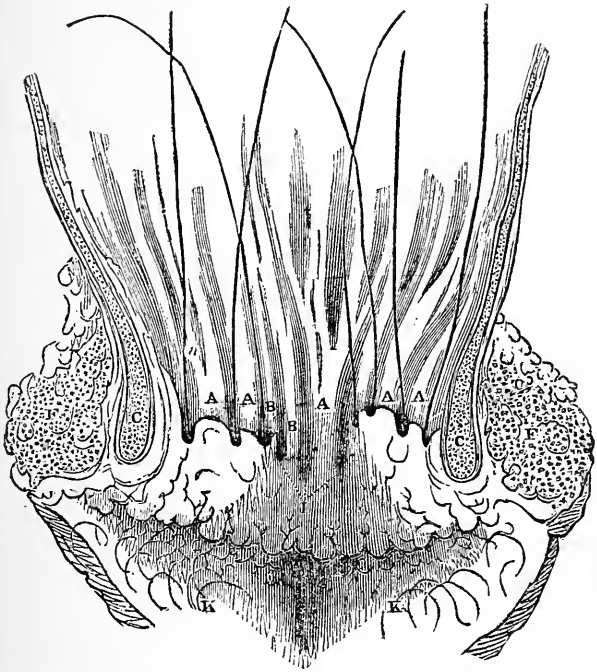

FIG. 6.—A Vertical Section of the Anterior Parietes of the Anus, with the whole canal displayed so as to show the relations of the sacculi of the middle region, and their relations to the surrounding parts, their orifices being marked by bristles. A, A, Columns of the rectum; B, B, rudiments of columns; C, internal sphincter; F, external sphincter; I, rudimentary or imperfect sacculi; K, K, radiated folds of the skin, terminating on the surface of the nates. *n*, A bristle in one of the sacs. (Horner.)

or three in the same patient, and I have mistaken their orifices for the internal openings of blind fistulæ; but only in a few cases have I found any inflammatory process concealed within them. I have, however, a few times discovered a pathological condition similar to that described by Vance under Ulceration of the Rectum.

The mucous membrane may, for the purpose of study, be

divided into three separate layers, the muscular, glandular, and epithelial. (Fig. 4.)

The muscular layer (*muscularis mucosæ, sustentator tunicæ mucosæ*) is a layer of unstriped muscular tissue about 0.02 mm. thick, which is everywhere found in the deepest layer of the mucous membrane, extending from the œsophagus to the rectum, but is more strongly developed in the region of the anus, where it serves to hold the membrane in place and prevent prolapse. It consists of bundles running in some parts both longitudinally and circularly, and in others in one direction only; and which send prolongations up between the glands to the villi.

The glandular layer is about 0.07 mm. in thickness. It consists of a layer of Lieberkuhn's follicles, with an occasional solitary closed follicle below them, the situation of which is marked by a slight depression in the mucous membrane, and an absence of the tubular follicles at that point. The follicles are tubular depressions arranged with great regularity, and set so closely together that the width of the intervening tissue is, on the average, about one-sixth the diameter of the follicle. The length of the tubes is four or five times their diameter, the respective measurements being: length, 0.35 mm.; diameter, 0.08 mm. These tubular depressions or follicles are lined with epithelial cells arranged with their bases resting on the connective tissue and their apices free in the cavity of the follicle; and the cells of one follicle are directly continuous with those of the next, hanging freely into the lumen of the bowel as they pass over from one depression into the next. The appearance of the cells is analogous to that of a bee's honeycomb, the intervening wall being common to two cells. The intertubular tissue consists of a fine trabecular network, the meshes of which are very long in the vertical direction running parallel to the follicle (Cripps).

The follicles of Lieberkuhn are simply inverted villi, and answer the same purpose of absorption. There are good reasons for the substitution of follicles for villi in this part of the canal, the former being less subject to injury from hardened fæces; and the fact of such substitution gathers great weight from the fact that in certain cases where an artificial anus has been established, the whole bowel below that point has been found in after-years covered with a growth of villi.[1]

Muscles of the Rectum and Anus.—The muscles which may

[1] Specimen No. 1288, Museum of College of Surgeons. (Cripps.)

properly be included in a description of the rectum and anus are the external and internal sphincters, the levator ani, ischio-coccygeus, retractor recti or recto-coccygeus, and the transversus perinei.

External Sphincter.—The external sphincter muscle is a thin layer of voluntary fibres, about half an inch broad on each side of the anus, surrounding it in the form of an ellipse, and having a narrow, pointed insertion anteriorly and posteriorly. It is situated immediately beneath the skin, and extends about two centimetres up the bowel, where its upper limit may sometimes be seen by the white line between it and the internal sphincter already mentioned. It is divided into a superficial and a deep portion. The superficial is inserted, both in front and behind, into the subcutaneous cellular tissue. The deeper and thicker portion is inserted posteriorly by a narrow, flat tendon into the posterior surface of the fourth coccygeal vertebra. Between the tendon and the bone is a bursa about the size of a pea—bursa mucosa coccygea of Luschka. Anteriorly it is inserted into the central tendon of the perineum in common with the transversus perinei and bulbo-cavernosus, and in women with the sphincter vaginæ. The action of the muscle is to close the anus and, under the control of the will, to antagonize the proper dilators of the anus as well as the peristaltic action of the bowel and the contraction of the diaphragm. The superficial band of fibres acts only in puckering the skin. The nerve supply comes from the hæmorrhoidal branch of the internal pudic, and the hæmorrhoidal branch of the fourth sacral nerve.

Great variations will be found in this muscle in different persons. In some it is strong, in others weak. In some it closes the anus so tightly that a finger cannot be inserted without great pain; in others a full-sized Sims's speculum can be passed without difficulty. A condition of weakness causing a patulous anus is a very common symptom of grave disease of the rectum; and the same patulous condition is considered by the French writers as a proof of the constant practice of passive pæderasty, but without sufficient grounds. The muscle is adapted for frequent contraction and expansion, and there is no reason for believing that the frequent introduction of the male organ should cause its paralysis any more than the equally frequent passage of fæces. However it may be in warmer climates, I know that it would not do in America to infer the practice of unnatural vice from a relaxed and funnel-shaped anus, as seems to be the case in France.

Internal Sphincter.—The internal sphincter is an involuntary muscle situated immediately above and partly within the deeper portion of the external sphincter, being separated from it by a layer of fatty connective tissue. Its thickness is about two lines; its vertical measurement from half an inch to an inch; and it is a direct continuation of the involuntary circular fibres of the bowel, growing thicker and stronger as they approach the anus. It also is supplied by the hæmorrhoidal branch of the internal pudic.

In dissecting this muscle for demonstration, it should be approached from the mucous surface of the bowel. It will be found answering to this description in a general way in most cases, but is subject to many variations, due to its different degrees of development in different subjects. In some it is very well marked; in others scarcely distinguishable from the rest of the circular muscular fibres.

Recto-coccygeus (Retractor recti, Treitz;[1] Tensor Fasciæ Pelvis, Kohlrausch).—This muscle consists of two flat lateral bands of unstriped fibres, each of which is about four mm. broad, which diverge at an acute angle from the anterior coccygeal ligament at the tip of the coccyx, and, passing forward and downward, embrace the lower end of the rectum on each side like a fork. It is located directly under that portion of the levator ani which forms the floor of the pelvis between the tip of the coccyx and the anus; and blends partly with the longitudinal muscular fibres of the rectum, and partly with the pelvic fascia surrounding its end. Its function is to hold the end of the rectum against the coccyx and to give it a fixed point in defecation.

Levator Ani.—The levator ani and ischio-coccygeus muscles form a true diaphragm to the pelvis by giving an uninterrupted muscular and tendinous plane from the lower border of the pyriformis, behind, to the arch of the pubes in front. That part which is named ischio-coccygeus is usually described as a separate muscle, though in no way differing in function from the larger portion, and only distinguishable from it by its more tendinous structure. It is situated just in front of the sacro-sciatic ligaments, and arises by aponeurotic fibres from the sides and tip of the spine of the ischium, from the anterior surface of the lesser sacro-sciatic ligament, and often from the posterior part of the pelvic fascia. It is inserted, also by aponeurotic fibres, into

[1] "Vierteljahrsschrift f. prakitsche Heilkunde," Prag., 1863, bd. i., s. 124. Henle: Abbildung 2, 183.

the border of the coccyx and lower part of the border of the sacrum. Owing to its tendinous origin and insertion, the greater part of the muscle is composed of aponeurotic fibres. It is in relation superiorly, by its concave surface, with the rectum; inferiorly, by its convex surface, with the sacro-sciatic ligaments and the gluteus maximus; posteriorly its border is in contact with the lower border of the pyriformis; and anteriorly it is directly continuous with the fibres of the levator ani. Its action is to draw the coccyx to its own side, or, when both muscles

Fig. 7.—Side View of the Levator Ani. A, anus; B, bladder; C, coccyx; R, rectum; L A, levator ani muscle; S, pubic bone sawn through external to symphysis. The fibres of the levator ani are seen arising by a tendinous attachment from the pubic bone; the posterior fibres then cross the rectum at nearly right angles, two inches from the anus, to be inserted into the coccyx.—Drawn from a dissection by William Pearson at the Royal College of Surgeons. (After Cripps.)

act together, to fix that bone and prevent its being thrown backward in defecation. It has no such action as would justify the name of levator coccygis, given it by Morgagni. Its nerve supply is from the anterior branch of the fourth sacral nerve.

The levator ani proper, which constitutes the remaining portion of the pelvic diaphragm, is in its general shape an inverted cone, supporting the pelvic contents in its cavity and allowing

the rectum and prostate to pass through its apex. Considering each lateral half of the muscle apart, we find it made up of a delicate layer of muscular fibres forming a thin, curved, and quadrilateral sheet, broader behind than in front. Its upper border is stretched across the pelvis from the pubes to the spine of the ischium, arising from both these bony points and from the tendinous line of union of the pelvic with the obturator fascia, which runs antero-posteriorly between them. Its attachment to the pubic bone is at a point on its inner surface near the middle of the descending ramus and a little to one side of

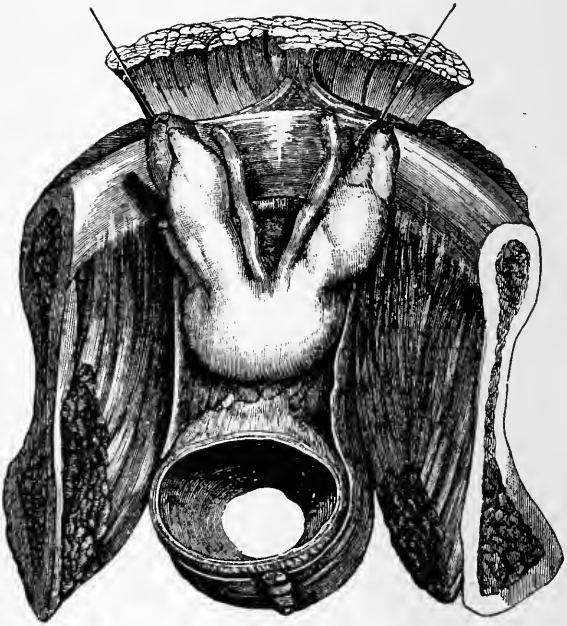

FIG. 8.—Levatores Ani seen from Behind. The prostate and vesiculæ seminales have been drawn upward by hooks. The free posterior borders of the levatores ani are seen passing downward from near the symphysis to the coccyx, partially encircling the rectum in their course.—From a dissection by William Pearson at the Royal College of Surgeons. (After Cripps.)

the symphysis. This attachment will be found to vary somewhat in different dissections, being sometimes a little higher or a little lower on the bone, and sometimes on the cartilage between the bones. The muscular fibres may also be traced at times upward into the pelvic fascia above its junction with the obturator. (Figs. 7 and 8.)

From this extensive though delicate and in great part membranous origin, the fibres proceed downward and inward toward

the median line. Those most anterior unite with those of the opposite side beneath the neck of the bladder, the prostate, and the adjacent portion of the urethra. These fibres are concealed by the pubo-prostatic ligament or anterior fold of the recto-vesical fascia, from which they also sometimes take origin in part. They are in relation, in front, with the posterior surface of the triangular ligament. This portion is sometimes separated from the main body of the muscle by a cellular interval, similar to those often found in other parts of this thin muscular sheet.

The fibres which arise from the tip of the spine of the ischium are inserted into the side of the tip of the coccyx, while the fibres immediately in front of these (precoccygeal) unite with those of the opposite side in the median line and form a *raphé* which extends from the point of the coccyx to the posterior border of the sphincter, and thus complete the floor of the pelvis.

The fibres which arise indirectly from the upper part of the obturator foramen and from the brim of the pelvis by means of the pelvic fascia, pass downward and inward, forming a curve with its concavity upward, and may be divided into vesical and anal. The vesical pass into the sides of the bladder. The anal fibres in part pass backward and meet behind the bowel, and in part blend with those of the external sphincter at its upper border, there being no distinct line of separation between the two muscles.

The relations of the levator ani are of great surgical importance. Superiorly its surface is covered by the superior pelvic fascia (the recto-vesical layer of the pelvic fascia), which separates it from the peritoneum and pelvic organs. The space between this fascia and the peritoneum is the superior pelvi-rectal space of Richet. (See Fig. 43.) Its inferior surface is separated from the obturator internus muscle by the obturator fascia, and beneath this is the ischio-rectal fossa. The posterior part of the muscle is in relation with the gluteus maximus.

The actions of this muscle are various. First, it acts as a support to the pelvic organs, and antagonizes the diaphragm and abdominal muscles when they act upon the abdominal contents. By enclosing the neck of the bladder the muscle acts upon it also, and in the act of defecation, when the muscle is contracted to open the anus, the neck of the bladder is pressed upon and the urethra closed. In this way is explained the well-known difficulty of passing urine and fæces at the same time.

By enclosing the bladder, vesiculæ seminales, prostate, and rectum in its grasp, the muscle produces a sympathy among these parts which will often be found very distressing in diseases of the rectum or after operations for their relief—such as impossibility of micturition, erections, and lancinating pain due to spasmodic action of the muscle. It will often happen that after a complete paralysis by free division of both sphincter muscles in an operation upon the rectum, the patient will still complain of a sharp, spasmodic pain at intervals—just such a pain as is caused by spasmodic contractions of the sphincter. In such cases it is the levator ani which is at fault. The muscle also aids the longitudinal fibres of the rectum in their opposition to the dragging of the fæces; and the anal fibres also draw the rectum upward and forward and compress it on the sides, and thus aid in the expulsion of its contents.

The voluntary sphincteric action of this muscle in connection with the ischio-coccygeus is of considerable power. It is brought to bear at a point about an inch and a half above the anus (above that of the involuntary internal sphincter), and no doubt in a measure accounts for the partial control over the passage of fæces often seen after destruction of both the internal and external sphincters.

The muscle receives a filament from the fourth sacral nerve on its pelvic surface, and another from the internal pudic.

Transversus Perinei.—This also has an action in defecation. Its fibres do not always blend with those of the opposite side in the median *raphé*, but the two muscles are sometimes continuous, traversing the anterior extremity of the external sphincter. In such a case the two muscles form a continuous half-ring, the concavity of which is directed backward and embraces the anterior part of the rectum, assisting powerfully in defecation by pressing the anterior against the posterior wall of the bowel in conjunction with the external sphincter (Cruveilhier).

Arteries.—The rectum is supplied with blood from five arteries, one single and two pairing.

The superior hæmorrhoidal is single and is a direct branch of the superior mesenteric. It is the direct continuation of the parent trunk, passing into the pelvis behind the rectum in the fold of the meso-rectum, and dividing into two branches which extend, one on each side of the bowel, to its lower end. About five inches from the anus these subdivide into smaller branches, about seven in number, which pierce the muscular coat about two inches lower down. They then descend between the mu-

cous and muscular layers at regular intervals to the end of the bowel, where they communicate in loops opposite the internal sphincter, and anastomose with the terminal filaments of the middle and inferior hæmorrhoidal arteries.

The middle hæmorrhoidal arteries—one on each side—are not constant in their origin, sometimes coming from the hypogastric or the inferior vesical, and sometimes from other sources.

The inferior hæmorrhoidal arteries—also pairing—are usually given off from the internal pudic near the point where it crosses the tuber ischii. They cross through the fat of the ischio-rectal fossæ, and are distributed with the middle hæmorrhoidal to the lowest part of the rectum, and to the anus and adjacent skin.

Veins.—There are three sets of rectal veins, as there are three sets of arteries, the superior, middle, and inferior; and these are so arranged as to form two distinct venous systems—the one, rectal, and returning its blood to the vena portæ; the other, anal, returning its blood through the internal iliac. The first, or rectal circulation, is made up of the superior hæmorrhoidal vein; the second, or anal, is made up of the middle and inferior hæmorrhoidal veins, the middle receiving its blood from the anus, and the inferior from the adjacent integument. The middle hæmorrhoidal ascends obliquely into the ischio-rectal fossa; the inferior starts horizontally from the skin of the anus and empties into the internal pudic.

The middle hæmorrhoidal is formed from two venous trunks, one on the anterior, the other on the posterior aspect of the rectum, which, by anastomosing with the corresponding branches from the opposite side, surround the sphincter in a venous circle. From this circle spring the collateral branches, which by their successive division and anastomoses form a true venous plexus. The inferior hæmorrhoidal vein also has a plexiform arrangement at its origin, but its branches are situated between the skin and the inferior border of the external sphincter. The rectal pouch is not, therefore, supplied with blood from the external hæmorrhoidal veins, but only the anus and the region of the sphincters.

When, on the other hand, the venous circulation of the rectum proper is injected from the inferior mesenteric vein, three or four large venous trunks may be seen on the external surface of the rectum ascending on the sides and posteriorly. (Figs. 9 and 10.) These veins make their appearance suddenly by five or six branches, which perforate the wall of the bowel about three

inches from the margin of the anus. If the rectum be opened longitudinally, and the mucous membrane dissected up to a sufficient height (about four inches), it will be seen that these five or six large veins, already visible on the outside of the bowel, come from within, and that they have already pursued quite a long course under the mucous membrane. They are formed by collateral branches, and especially by about a dozen primitive branches, which originate about half an inch above the anus

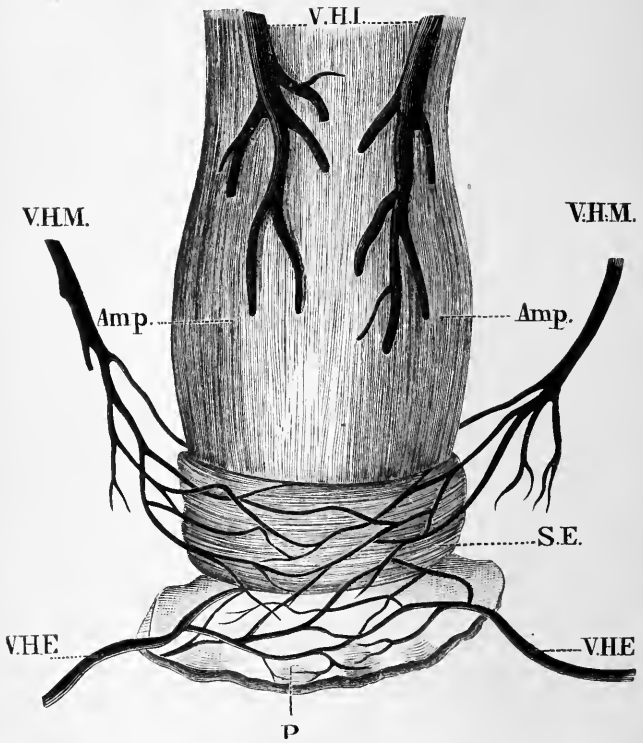

Fig. 9.—Rectal Veins seen from without. (Duret.)[1] Amp., rectal pouch; S. E., external sphincter; P., skin at margin of anus dissected up and turned back; V. H. I., internal hæmorrhoidal vein; V. H. M., middle hæmorrhoidal vein; V. H. E., external hæmorrhoidal vein.

and ascend in parallel and flexuous lines for several centimetres to unite into common trunks. Each of these little ascending branches has its origin in a minute pool of blood, the size of which varies in the normal state from that of a grain of wheat to that of a small pea.

[1] "Recherches sur la Pathogénie des Hémorrhoïdes," Arch. Gén. de Méd., December, 1879.

These little sacs are arranged in a circular form around the extremity of the rectum. If carefully dissected they may be seen to be connected with the little veins before mentioned, and also with another little vein which perforates the internal sphincter near its lower edge, and empties into one of the rudimentary branches of the external hæmorrhoidal plexus. Many of these little communicating branches between the external and internal hæmorrhoidal systems pass through the substance

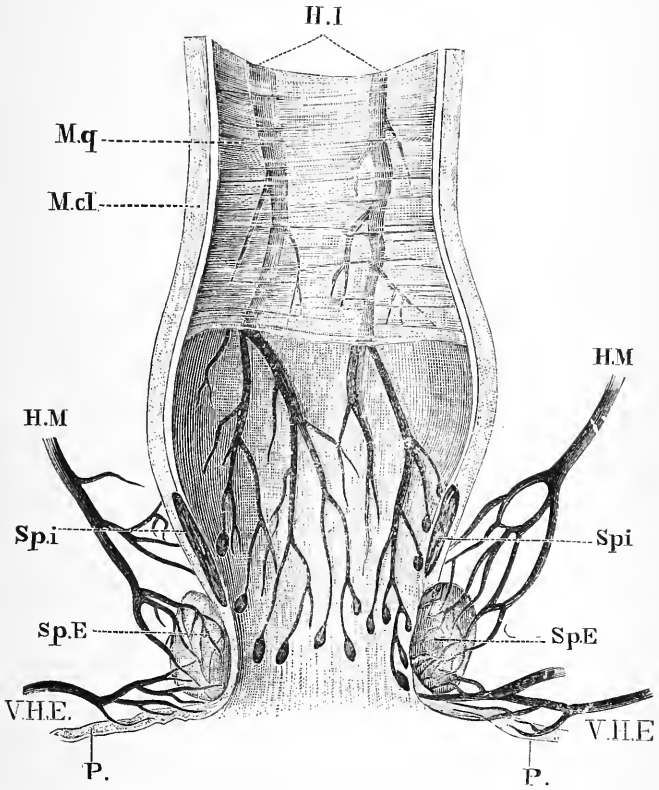

FIG. 10.—Rectal Veins seen from within. (Duret.) M.q., mucous membrane dissected up and cut away below; M. cl., muscular tunic; Sp. I., internal sphincter; Sp. E., external sphincter; P., skin: H. I., internal hæmorrhoidal vein; H. M., middle hæmorrhoidal vein; V. H. E., external hæmorrhoidal vein.

of the external sphincter. It results from this that when the external sphincter is contracted the anastomosis between the two systems is prevented.

Verneuil has laid stress upon the fact that where the internal or superior hæmorrhoidal veins perforate the rectal wall from within outward, they pass through "muscular button-

holes" surrounded by no fibrous tissue, and having, therefore, the power of contracting round the vein, closing its calibre, and preventing the return of blood to the liver. In this anatomical arrangement he believes he has found the active cause of internal hæmorrhoids.

The disposition of the rectal veins into two distinct systems, the one internal and the other external, is fully in conformity with our knowledge of the development of the rectum and anus. The rectal *cul-de-sac* is at first situated at some distance from the perineum, and as it descends it carries with it its own proper vascular supply. The anal depression is of necessity provided with an independent set of veins, and when the rectum and anus are finally united into one canal the two venous systems also unite.

The internal hæmorrhoidal veins also communicate freely with other branches of the internal iliac around the trigone of the bladder by means of minute branches, from one-half to one mm. in diameter, which pass through the prostate and vesiculæ seminales.

Nerves.—The nerves of the rectum and anus are derived from both the cerebro-spinal and sympathetic systems. The former are branches from the sacral plexus, the latter from the mesenteric and hypogastric plexuses. The spinal nerves are derived from the third and fourth sacral, which supply visceral branches to all the pelvic organs, anastomosing with branches from the sympathetic. The muscular branches from the same nerves have already been spoken of in connection with the individual muscles. The fifth sacral nerve also sends a small twig to the coccygeus. The posterior branch of the superficial perineal nerve from the internal pudic supplies the skin in front of the anus, while the anterior branch gives several small filaments to the levator ani.

The inferior hæmorrhoidal branch from the pudic supplies the lower end of the rectum, the external sphincter, and the skin of the anus. This nerve may come direct from the sacral plexus through the lesser sacro-sciatic notch. The posterior branches of the sacral nerves also supply the skin over the coccyx and around the anus.

According to a brief contribution of W. Krause,[1] the nerves end in the mucous membrane of the anus, in club-shaped bulbs, about 0.05 mm. in diameter, which lie under the bases of papillæ.

[1] Esmarch, op. cit., p. 10.

The tonic contraction of the external sphincter muscle is, in part at least, due to the influence of a nerve centre located in the lumbar region of the spinal cord.[1] If the nerve connection of the sphincter with the spinal cord be severed, relaxation of the muscle takes place. The fact that division of the cord in the dorsal region does not affect the sphincter, except temporarily by shock or depression, proves that this centre is not located above the lumbar region. This nerve centre is subject to various influences; and the sphincter may either be relaxed, or its tonic contraction increased, by local stimulation, or by the influence of the will or emotions.

Though the dependence of the sphincter for its tonic contraction upon the lumbar nerve centre seems so great, still it is not absolute. In the case of a man in whom the sacral nerves were entirely paralyzed by an injury, and in whom, therefore, there was no nerve connection with the lumbar centre except perhaps through the sympathetic, Gower[2] observed the maintenance of a certain amount of tonic contraction, which could be inhibited and relaxation produced by stimulation of the mucous membrane of the rectum and anus. From this it would appear that the tonic contraction of the sphincter, as is known to be the case in the arterial system, is habitually dependent on a spinal centre, but may, nevertheless, exist without the action of that centre. The paralysis of the muscle which follows brain lesions is probably due merely to inhibition of the spinal centre, and not to the injury of any centre located in the cerebrum.[3]

The distribution of the spinal nerves serves to explain many of the reflex and so-called anomalous symptoms of pain which are encountered in diseases of the rectum and anus. Brodie[4]

[1] Masius, Bull. de l'Acad. Royal de Belgique, xxiv. (1867), p. 312. (Foster's "Physiology," p. 387.)

[2] Proc. Roy. Soc. (1877), p. 77.

[3] Foster's "Physiology," p. 388. Philadelphia, 1880.

[4] A lady consulted me, says Mr. Brodie, concerning a pain to which she had been for some time subject, beginning in the left ankle and extending along the instep toward the little toe, and also into the sole of the foot. The pain was described as being very severe. It was unattended by swelling or redness of the skin, but the foot was tender. She labored also under internal piles, which protruded externally when she was at the water closet, at the same time that she lost from them sometimes a larger and sometimes a smaller quantity of blood. On a more particular inquiry I learned that she was free from pain in the foot in the morning; that the pain attacked her as soon as the first evacuation of the bowels had occasioned a protrusion of the piles; that it was especially induced by an evacuation of hard fæces; and that, if she passed a day without any evacuation at all, the pain in the foot never troubled her. Having taken all these facts into consideration, I prescribed for her

relates an instructive case of pain in the foot over the distribution of the sciatic which was cured by curing prolapsing hæmorrhoids—the irritation being primarily at the termination of the internal pudic, and conveyed thence to the sacral plexus, to be carried to the termination of the great sciatic; and I have the notes of an exactly analogous one in a man. In the same way a fissure of the anus or other disease of the rectum may cause pain in the lumbar and iliac regions, pain, loss of sensation, and cramps in the legs, and symptoms of bladder and urethral disease, besides more general nervous phenomena. (See Fig. 11.)

The chief nerve supply of the rectum is at the lower portion and around the anus—the middle and upper portions possessing very little sensibility; so little, in fact, that the gravest diseases, such as cancer or ulceration, may exist and not manifest them-

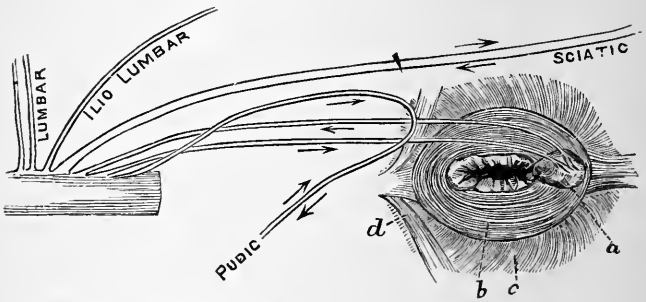

FIG. 11.—Diagrammatic View of the Nerves of the Anus. (Hilton.) *a*, Ulcer on sphincter; *b*, the filaments of two nerves are exposed on the ulcer, the one a sensory and the other motor, both attached to the spinal marrow, thus constituting an excito-motory apparatus; *c*, levator ani; *d*, transversus perinei.

selves by pain. This also explains how large masses of fæces may accumulate in the rectal pouch without causing suffering. Puncturing the bladder through the rectum is not a painful operation, and applications of strong acids to the mucous membrane will cause little suffering if the skin be properly protected. Exactly the opposite condition obtains at the anus, the extreme sensibility of which is well known.

the daily use of a lavement of cold water; that she should take the Ward's paste (confectio piperis composita) three times daily, and some lenitive electuary at bedtime. After having persevered in this plan for a space of six weeks, she called on me again. The piles had now ceased to bleed, and in other respects gave her scarcely any inconvenience. The pain in the foot had entirely left her. She observed that, in proportion as the symptoms produced by the piles had abated, the pain in the foot had abated also.—Medical Gazette, vol. v.

The pelvic plexuses of the sympathetic are placed one on either side of the rectum and vagina. Each is composed of prolongations from the hypogastric plexus above, united with branches from the sacral ganglia. The spinal branches to the sympathetic are mostly from the third and fourth sacral nerves. From the back part of the plexus thus formed are given off the inferior hæmorrhoidal nerves, which join with the superior hæmorrhoidal from the inferior mesenteric artery and perforate the rectal wall.

Lymphatics.—The lymphatic vessels of the rectum are arranged like those of the intestine generally, in two layers; one beneath the peritoneum and one between the mucous and muscular coats. Immediately after leaving the bowel some of the vessels pass through small adjacent glands, and all finally enter the glands in the hollow of the sacrum, or those higher up in the loin.

But just as there is an internal and external system of veins, one proper to the rectum, the other to the anus, so is there another lymphatic system, which comes from the integument around the anus and passes to the glands in the groin; and these two sets of vessels freely communicate with each other. A knowledge of this fact is of importance in the diagnosis of cancer of the rectum; and the glands which are deep in the pelvis along the sacrum should always be felt for, as well as those located in the groin.

Defecation.—A study of the anatomy of the rectum would not be complete without some reference to its physiological functions. We shall, therefore, in this place consider the function of defecation.

In regard to defecation the question at once arises, how, after destruction of the lower end of the rectum, or paralysis of the sphincters, there still remains a certain amount of control over the evacuations? Such an injury is often only noticeable through a constant discharge of rectal mucus, and an occasional involuntary escape of fluid fæces when the patient is suffering from diarrhœa. This leads naturally to a consideration of the third or superior sphincter muscle,[1] whose existence has been

[1] Gosselin: "Rétrécissements Syphilitiques du Rectum," Arch. Génl. du Méd. 1854, p. 668.
Henle: "Handb. der systemat. Anat. des Menschen," 1873, bd. ii.
Hyrtl: "Handb. der topogr. Anat.," Wien, 1857, bd. ii., pp. 108, 109.
Sappey: "Traité d'Anat. Descriptive," Paris, 1874, t. iv.
Chadwick: "Trans. of the Am. Gynæcol. Soc.," ii., 1877.

supposed to account for such control of the evacuations as exists in this condition.

It is now about half a century since Nélaton first described the third sphincter muscle, and, in spite of all that has been written concerning it since that time, it is only a few years since Van Buren[1] characterized it as an organ to which anatomy and physiology had been equally unsuccessful in assigning either certainty of location or certainty of function. For the original description of the muscle by Nélaton we are indebted to Velpeau, who writes that he has verified the existence of a sort of sphincter of the rectum, lately discovered by Nélaton, and goes on to say that it is a muscular ring situated about four inches above the anus, just in the place where retractions of the rectum are most often found. If, after turning the rectum so that its mucous surface is external, it is moderately distended by insufflation, the muscle will be seen to be made up of fibres collected into bundles. Its breadth is from six to seven lines in front, and about an inch behind. Its thickness, on the contrary, is much greater in front, where the fibres appear to be collected in the angle which corresponds to the union of the first and second curves of the rectum, while behind they are scattered over its convexity. After thus adopting the description of Nélaton, Velpeau[2] brings out one other anatomical point—the attachment of the muscle posteriorly to the front of the sacrum. The functions ascribed to the muscle by Nélaton were those of keeping the rectum empty until a short time before the act of defecation; separating the fæcal mass and preventing its regurgitation during defecation; and of opposing the continuous and involuntary escape of fæces after the destruction of the lower sphincters.

Hyrtl refers to this description, and himself describes the muscle as being six or seven lines in breadth anteriorly and an inch posteriorly, but does not always find it present. He also in

Pétrequin: "Traité d'Anat. Topogr. Med.-Chirurg.," etc., 2me éd., Paris, 1857, p. 414.

Houston: "Dublin Hosp. R.," v., 1830.

O'Beirne: "New Views of the Process of Defecation," etc., Dublin, 1833.

Bushe: "Treatise on the Malformations, Injuries, and Diseases of the Rectum and Anus," New York, 1837.

Kohlrausch: "Anat. u. Physiol. der Beckenorgane," Leipzig, 1854.

Rosswinkler: Wien. med. Woch., 1852, p. 435.

Foster: "Text-Book of Physiology," Philadelphia, 1880, p. 387.

[1] "On Phantom Stricture," etc., Am. Jour. of the Med. Sci., October, 1879.

[2] Velpeau: "Traité d'Anat. Chirurg.," 3me éd., 1837, Introduction, p. 39.

one case demonstrated the attachment to the sacrum. Sappey admits its frequent existence, and locates it at the level of the base of the prostate, in the middle portion of the rectum, six, seven, eight, or sometimes nine centimetres from the anus. It never completely surrounds the rectum, but only one-half or two-thirds of its circumference ; and it appears to him to be caused by a grouping of the circular muscular fibres, some being gathered from below upward, and others from above downward, to the same point. Its breadth is one centimetre and its thickness two or three millimetres. Situated sometimes in front, sometimes behind, and again laterally or antero-laterally, it is constant in nothing except its direction perpendicular to the axis of the bowel. In place of one, he has sometimes found two bands at opposite points and different levels, and in one specimen which he has preserved there were three. Henle adopts Sappey's description in the main. Pétrequin found the muscle irregularly oblique, less marked in the front wall than in the back, and consisting of a collection of weak bands of fibres. Chadwick asserts that no distinct muscle exists, but describes in place of it two agglomerations of the circular muscular fibres, one on the anterior and one on the posterior wall, corresponding to two semicircular constrictions, which may be felt by digital examination, and whose effect is to give the rectum its sigmoid curve.

The third sphincter muscle and the valves of mucous membrane in the rectum are not, as might be supposed, one and the same thing, though it is true that they have become almost hopelessly confounded in surgical and anatomical literature, and are often spoken of as identical. As far as possible, we shall try to consider them separately, without doing violence to the text of the authorities. The valves of the rectum (we use the word simply as expressing the folds of mucous membrane) were first described by Houston at about the same time that Nélaton described the superior sphincter ; and it is worth remembering that the two authors were writing about two entirely different things, and two things which stood in no necessary relation to each other, so far as we may judge from their descriptions. Houston's method of preparation was by filling and distending the gut with spirit before its removal from the body, and then laying it open longitudinally. He states that the folds disappear if the bowel is first removed from its natural position and then distended, but that they may be seen in the natural condition of the parts soon after death, before the tonic

contraction has disappeared; and that they are then found to overlap each other so effectually as to require considerable manœuvring in order to pass a bougie or the finger along the bowel. It is also remarked that this is just the arrangement necessary to prevent the fæces from urging their way toward the anus, where their presence would excite a constant sensation demanding their discharge.

According to this first and clearest of all the descriptions—for the whole article is written with a force and clearness of style which have perhaps had an undue weight in disarming criticism as to the facts—the valves exist in all persons, but vary much in different individuals as to location and number. Three is the average number, though sometimes four, and again only two are well marked. The largest and most constant is about three inches from the anus, opposite the base of the bladder; the next most constant is at the upper end of the rectum; the third is about midway between these; and the fourth, or the one most rarely present, is attached to the side of the gut about an inch above the anus. The first one generally projects from the right wall; the one next above from the left; the uppermost from the right; and the one nearest the anus, when present, from the left and posterior wall; the arrangement being such, in spite of variations, as to form a spiral tract down the gut. The folds are described as semilunar in form, with the convex border attached to the side of the bowel, and occupying from one-third to one-half of its circumference. The surfaces are sometimes horizontal, but more often oblique, with the sharp, concave, floating margin generally directed a little upward. In breadth they vary from one-half to three-quarters of an inch or more in the distended state of the gut; and they are said to be composed of a duplicature of mucous membrane enclosing some cellular tissue and a few of the circular muscular fibres.

The palpable weak points in Houston's article were very soon pointed out by O'Beirne, in a work of marked and almost amusing originality. The views were indeed "new," but they are to-day accepted in many points by those whose judgment is worthy of the most confidence in these matters. O'Beirne seems rather to regret that he is unable to accept Houston's statements as to an anatomical condition which would account so fully and so easily for the physiological emptiness of the rectum and fulness of the sigmoid flexure on which his own views depend; but nevertheless he sets himself to the task of demolishing them with great vigor and considerable success. Although he believes

the rectum to be normally empty, except just at the time of defecation, he believes that condition to depend upon the anatomical arrangement of the sigmoid flexure, joined with the narrowing of the upper end of the rectum, which is entirely independent of any folds of mucous membrane. He not only denies the existence of any such folds, but states flatly that Houston is altogether incorrect in his statement that Cloquet or any other anatomist before his time makes even the slightest allusion to them.[1] He believes the folds to have been produced by the method of making the preparations—distending and hardening all the parts with spirit before making the incision—and asserts that this method is anything but natural, and nothing more or less than an attempt to exhibit natural appearances by placing the parts in an unnatural situation—such a situation, indeed, as is not known to be necessary for the exhibition of the valvulæ conniventes or any other valves of the body. He meets the statement, that by the ordinary procedure of distending the rectum after removal from the body the valves are made to disappear, by the question, why, if such valves really exist, and if muscular fibres enter into their structure, they should not be discoverable at any time after death, or in any state of the intestine—a question very difficult of solution.

Four years later the voice of a New York surgeon was raised against these folds, and in almost the same language as O'Beirne's, though from an entirely independent standpoint. Bushe declares that he has never, in the living body, been able to detect any valve of such firmness, and capable of exerting any such influence upon the descent of the fæces, as Houston describes, though he has frequently met with accidental folds produced by the partial contraction of the bowel; and the proof that they are accidental is that, in the same subject, he has on different days found them to occupy different situations, but they were always unresisting and easily displaced by the extremity of

[1] Regarding this question of fact, it may be well to quote Cloquet's description from Bushe, op. cit., p. 60: "The inner surface of the rectum is commonly smooth in its upper half, but in the lower there are observed some parallel longitudinal wrinkles, which are thicker near the anus, and are variable in length. These wrinkles, whose number varies from four to ten or twelve, and which are called the columns of the rectum, are formed by the mucous membrane and the layer of the subjacent cellular tissue. Between these columns there are almost always to be found membranous semilunar folds, more or less numerous, oblique or transverse, of which the floating edge is directed from below upward toward the cavity of the intestine. These folds form a kind of lacunæ, of which the bottom is narrow and directed downward." It seems evident that the sinuses of Morgagni are here referred to.

the finger. He points out that, by the method of hardening the rectum after distending it with spirit, these accidental folds are rendered permanent by the induration resulting from the action of the alcohol; and that, by the method of inflation and drying, the projections resembling valves are produced by the angles formed by the setting of the intestine during the process of desiccation.

Kohlrausch describes and figures one important fold, the plica transversalis recti, which he locates at the same point as Houston's most constant one, projecting well into the lumen of the bowel from the right side. It forms rather more than a semicircle, and runs further on the anterior than on the posterior wall. Here also we meet the direct statement that this fold is now known as the sphincter ani tertius, though Kohlrausch does not consider such a title justified by the anatomical condition, inasmuch as the circular muscular fibres do not enter into its texture, and are not more developed here than elsewhere. For, though both these things may happen, as a rule neither is the case.

Sappey says he has found in the empty state various folds of the mucous membrane, but that these have no determinate direction, and are generally only slightly marked. Three times only, in thirty recta which he examined, has he met with anything which at all answered to Kohlrausch's plica transversalis or to Houston's chief valve. There is nothing to prove that they persist when the rectum is full: on the contrary, it is probable that they are effaced by the simple fact of distention of the latter, at least in great part. The name of valve is not, therefore, applicable to them, and, admitting even that it might be used by one of those abuses of language so frequent in anatomy, Houston would still incur the discredit of having presented as normal a fact which is only observed very exceptionally.

Henle divides the valves into two varieties, the temporary and the permanent. Of the former he describes several, which may be present or absent in the same individual at different times or in different states of the bowel. Of the permanent variety there is only one—the plica transversalis—and this one is only present in a minority of subjects.

Hyrtl describes two folds, both constant: one on the right wall lower down, and one on the opposite side. Rosswinkler also describes two folds, but locates them on opposite sides to those of Hyrtl.

Otis[1] has undertaken some elaborate investigations on the cadaver concerning this point, with the aid of new instruments and appliances. The subject is placed in the knee-chest position, the anus is held open by retractors, and the illumination is obtained either by reflected light from a forehead mirror, or by a small electric light carried directly into the bowel.

Three precautions are used: the body is placed so that the abdominal organs are relieved as much as possible of all pressure anteriorly; the rectum is thoroughly emptied of fæces, to allow of the entrance of air; and the bladder is emptied. In this position the rectum is in what may be called a state of natural distention, having both definite form and fixation; and its cavity is seen to be lined throughout with smooth mucous membrane which no longer appears too large for its external coverings. Its general direction above the perineal curve corresponds with the curve of the sacrum and coccyx, but its internal surface is not that of an even cylindrical tube. It consists of large, saccular dilatations, marked off from each other by intermediate partitions or folds, projecting alternately from left and right, one beyond the other.

These partitions or folds are semilunar in shape, involving rather more than one-half of the circumference of the internal surface, and extending a little further on the anterior than on the posterior wall. They consist in great part of a duplicature of the mucous membrane, projecting at the centre, where they are deepest, from 1 to 2.5 cm. into the lumen of the bowel. The number of visible folds of this kind was always two or three, two of which were constant, the other variable. When two were present, the first was on the right side, about 6.5 cm. from the margin of the anus; the second on the left, about 2.5 cm. higher. When three folds were visible, the first was on the left nearer the anus, varying from 4.5 to 6 cm. from its margin, being in some bodies well marked, in others scarcely perceptible. The other two folds were always well marked and practically the same as those just described when only two were seen. The presence of three folds is more frequent than that of two. This saccular appearance is equally well seen in the lithotomy as in the knee-chest position.

The exterior of the rectum is divided more or less regularly into segments by transverse sulci or semicircular constrictions. These are confined to the sides of the rectum, and, as a rule, do

[1] "Anatomische Untersuchungen am menschlichen Rectum, und neue Methode der Mastdarminspection," von Walter J. Otis.

not extend beyond the median line in front or behind, where the longitudinal muscular fibres appear to be thicker. The number of these constrictions is not always the same, nor are they in all subjects equally well marked; but generally three or four are quite constant. One very noticeable constriction is always to be found on the right side, marking the upper limit of the rectal pouch, extending from a point opposite the upper border of the triangular portion of the base of the bladder, just a little below the lowest point of the peritoneal pouch, behind the right seminal vesicle, backward to a point opposite the upper part of the coccyx. These ridges correspond to the folds on the interior of the bowel, and with the mucous membrane covering them form the sacculi already described.

The longitudinal muscular fibres of the rectum are not distributed in a uniform layer, but are collected into two groups, one in front, the other behind, with a thin layer of fibres between them. In the colon the longitudinal fibres are collected into three distinct bands; one of these, the posterior, is placed along the attached border of the intestine, and can be traced down the posterior surface of the rectum as a distinct band, spreading out laterally and increasing in strength in its lowest part. Tracing the other two bands, they are found to gradually converge in the lower portion of the intestine, sometimes coming together for a short distance in the sigmoid flexure; then separating, to again unite at the commencement of the rectum, and to pass down its anterior surface as one broad band, spreading out laterally and increasing in strength at its lowest part. On the sides the longitudinal fibres form only a thin layer in the upper part, gradually thickening toward its lower end. These two bands of muscular fibres, anterior and posterior, are shorter than the intervening parts, hence the sacculation; and the constrictions on the lateral aspects of the tube are the divisions between the sacculi.

The folds described within the bowel are composed of mucous membrane and bands of circular muscular fibre in greater or less proportions. The longitudinal fibres do not enter into the construction of the folds. Dr. Otis suggests that the longitudinal bands on the rectum be called "ligaments of the rectum," anterior and posterior, corresponding as they do with the ligaments of the colon.

Excepting that this description of the arrangement of the muscular fibres and folds of mucous membrane is more exact and definite than any previously given—and as to this constancy

of location my own observation does not lead me entirely to agree—the author's conclusions from his dissections are not different from those of other writers. The valves and folds have always been accepted, though their definite and constant location have not been.

Regarding the so-called third sphincter, the author describes it simply as one of the thicker bundles of circular fibres on the lateral aspect of the bowel, without certainty of location or particular function beyond that of the other circular fibres.

There would be but little profit in following these descriptions of different writers, each of them an authority on the subject treated, any further ;[1] and so far as we have gone, we have carefully endeavored to avoid any violence to the meaning of the text in thus separating the thickening of the muscular fibres, which can alone constitute a sphincter, from the projections and redundancies of the mucous membrane which Houston first described under the name of valves. It will readily be seen that Van Buren was correct in speaking of the third sphincter as an organ to which anatomy and physiology had been equally unsuccessful in assigning certainty of location, for we have seen it described, on equally good authority, as both mucous membrane and muscle ; as on all sides of the rectum, and at almost all distances between two and four inches from the anus ; as single, double, and triple ; as composed of mucous membrane and cellular tissue without muscular fibre, and of well-marked muscular bands located at the base of the mucous folds and extending into their substance. From these very differences, perhaps, the true anatomy of the part may best be deduced. It is the old question of the gold and silver shield. There are bands of the circular muscular fibres of the rectum located at various points in its upper portion. These bands are more or less developed in different subjects, and are also found in no constant location, being sometimes lower or higher, and sometimes more marked on the anterior or again on the posterior wall. There are also found various folds and duplicatures of the mucous membrane, which stand in no constant relation to the thickened portions of the muscular fibre, and have no definite or constant situation, but may alter their shape with the

[1] Morgagni ("De Sedibus et Causis Morborum") says he found valves in two subjects, situated about an inch above the anus, in one of a circular, in the other of a crucial form. The references of Portal ("Anat. Méd."), Glisson, and Boyer ("Traité d'Anat.," Paris, 1815, t. iv., p. 377) probably all refer to the sinuses of Morgagni.

varying condition of the bowel, and are found at different points in different subjects. These folds vary also in their structure in different people, being larger and firmer in some than in others, and occasionally containing a few fibres of the circular muscle of the bowel.

This is also the conclusion reached by Gosselin, who says: "I do not find the line of demarcation (between the upper and middle portions of the rectum) established by a special sphincter analogous to that which some authors have indicated by the name of sphincter superior. I am convinced, indeed, by the examination of a large number of specimens, that the sphincter does not exist as an isolated muscle, and that, when we are led to admit its existence, we have to do with subjects in whom the bands of the circular layer are more developed than in others. I have often met this isolated development of some of the circular fibres, but it is by no means always present, and for this reason the superior sphincter has not always been found by those who have searched for it. When it exists it is at a variable height, sometimes between the middle and upper portions, sometimes at some part of the circumference of the latter, or at its very upper portion; and I explain in this way why O'Beirne has placed his superior sphincter at the junction of the rectum with the sigmoid flexure, while Nélaton has placed his lower down, without assigning it a determinate position."

It will be remembered that Hyrtl argued backward from what he considered the physiology of the rectum to the existence of a third sphincter; and that Houston, in describing the valves of membrane, asserts that such an arrangement as he discovered was just the one which was *a posteriori* probable, and which best accounted for the accepted theories of the physiology of defecation. Nélaton, too, though he described the muscle before he gave it an action, assigns to it the same function as Houston does to his folds, and as Hyrtl believed it must of necessity possess. It is plain that each was led by a certain chain of reasoning to believe in the existence of an obstruction to the passage of fæces from the sigmoid flexure above to the rectum below; and that two of them found it in the muscular structure, and the third in the mucous membrane of the bowel. The facts upon which the necessity for a superior sphincter are supposed to rest are briefly these: the normally empty state of the rectum, and the ability to retain both wind and motion after destruction of the anus and its muscles. The force of this line of argument cannot be disputed, but were some other reason-

able explanation found for these two facts than the existence of a third muscle, that muscle would soon be dropped from the descriptions of the anatomy of this part. The whole tendency of the physiology of the day is to furnish such an explanation.

The "new views" of O'Beirne with regard to the process of defecation were simply as follows: The repeated descent of fæcal masses causes the sigmoid flexure to become distended, and to ascend from its position in the cavity of the true pelvis into the left iliac fossa. When this occurs, the flexure, in proportion to the rapidity and degree of its distention, begins to turn upon the contracted rectum as upon a fixed point, until at length, like the stomach, it directs its greater arch forward and upward, and its lesser backward and downward. By this movement the contents are brought somewhat perpendicular to, and so as to press directly upon, the upper extremity of the contracted rectum. But as the mere weight is insufficient to force a passage downward, and as this end cannot be accomplished either by such gentle pressure as that exerted by the alternate contraction of the diaphragm and the abdominal muscles in ordinary respiration, or by the efforts of the flexure itself, in consequence of its muscular power being so inferior to that of the rectum, the fæces are compelled to remain stationary until such time as the increased accumulation and distention produce a sense of uneasiness sufficient to call into action those great expulsive agents, the diaphragm and abdominal muscles. These muscles, instead of acting alternately, now act simultaneously, compress the abdomen and its contents on all sides, urge the free and floating mass of small intestine downward and even into the cavity of the pelvis, so as to press forcibly not only upon the sigmoid flexure, but also upon the cæcum and urinary bladder. By these means the contents of the distended flexure are acted upon in every direction, and so as to be impelled against the upper annulus of the contracted rectum with a force sufficient to compel its parietes to separate and afford a passage. The nisus now ceases, but as soon as the rectum becomes filled it is aroused to make an expulsive effort by which its contents are driven or impacted into its pouch. Here they produce a great sense of weight and uneasiness in the perineum, an urgent desire to go to stool, and a still stronger nisus, by which the sphincters are forced open and dilated, and the final expulsion of the fæces is effected. This reasoning, it will be seen, is entirely based upon the normal empty and contracted state of the rectum, which O'Beirne not only states to be a clinical fact

capable of easy demonstration, but gives many reasons for, the chief being the great relative thickness of its muscular wall. He clearly pointed out also (what has been frequently verified since, and especially by those who have passed the hand into the sigmoid flexure of the living subject) that the upper extremity of the rectum was absolutely the smallest part of this portion of the bowel; but that nothing of the nature of a sphincter muscle, located at this point or near it, entered into his calculation any more than did the folds of mucous membrane.

Compare, now, these teachings of O'Beirne's, in 1833, which we have already said are to-day accepted by those who have the best right to judge of these matters, with those of Foster, in 1880. He says the fæces, in their passage through the colon, are lodged in the sacculi during the pauses between the peristaltic waves. Arrived at the sigmoid flexure, they are supported by the bladder and the sacrum, so that they do not press on the sphincter ani. Defecation is a composite act, being superficially the result of an effort of the will, and yet carried out by means of an involuntary mechanism. The voluntary effort is composed of two factors—a pressure effect produced by the contraction of the abdominal muscles, and a relaxation of the sphincter ani muscle. By the pressure of the abdominal muscles the contents of the descending colon are driven onward into the rectum, but the sigmoid flexure itself is shielded by its situation from the direct force of this pressure, and a body introduced *per anum* into the empty rectum is not affected by even forcible contraction of the abdominal muscles. The sphincter muscle guarding the anus is habitually in a state of tonic contraction, capable of being increased or diminished by a stimulus applied either internally or externally to the anus. This tonic contraction is due, in part at least, to the action of a nervous centre situated in the lumbar portion of the spinal cord. By the action of the will, by emotions, or by other nervous events, the lumbar sphincter centre may be inhibited, and thus the sphincter itself relaxed; or stimulated, and thus the sphincter tightened. This relaxation is the second of the voluntary elements in the act of defecation. By these two alone the contents of the descending colon might be pressed onward into the rectum and out at the anus; but since the sigmoid flexure itself is subject to neither of these influences, such a mode of defecation would always end in leaving it full; and therefore there is superadded to these two voluntary elements an entirely involuntary increase in the peristaltic action of the sigmoid flexure itself. The order of events

is the reverse of what we have stated. The sigmoid flexure and large intestine become more and more full, while stronger and stronger peristalsis is excited in their walls. By this means the fæces are driven against the sphincter. Through a voluntary act, or sometimes at least by a simple reflex action, the lumbar centre is inhibited and the sphincter relaxed. At the same moment the contraction of the abdominal muscles causes firm pressure on the descending colon, and the contents of the rectum are ejected.

It should be mentioned that the one fact on which these physiological views rest, viz., the normal empty state of the rectum, is not universally admitted. Indeed, as Hyrtl says, the rectum will be found, by any one who practises frequent digital examination, in very different states in this regard at different times in the same individual. This may or may not be entirely due to changes produced by constipation in those examined; but even he admits that it is more often found empty than any other part of the canal; and the difficulty which an opposite view leads to will be seen at once by the attempt of Bushe to explain the act of defecation, starting from the point that the fæces accumulate slowly in the rectum, and gradually lose their thinner parts by absorption while there. He goes on to say that they give rise to no uneasiness until a considerable quantity is amassed, when a sensation is created which demands their expulsion. This sensation is, he believes, not due to the mere contact of fæcal matter, for the latter generally accumulates in large quantities before the sensation is felt. Nor is it due to any peculiar acrimony which they obtain by their stay in the rectum, for when the fæces are fluid this sensation is produced as soon as they reach the rectum. Again, when once the sensation is felt and not attended to it passes away, and does not return till the next accustomed period: and the longer it is unattended to the less likely is it to return at all. In truth, he says, we are ignorant of the cause of this feeling, and must, in the present state of our knowledge, admit that it is organic, and consequently dependent upon some spontaneous change in the intestine, of which we know nothing. Rather a lame conclusion! Nor is the cause of this periodically recurring desire to evacuate the bowel touched upon in the exposition given by O'Beirne; and this is the weak point in his argument, and the one which renders Foster's explanation complete.

We need cite authorities no further to show that physiology no longer teaches the existence of an ever-present mass of fæces

in the lower bowel, ready to escape at any moment when the active watchfulness of the sphincter muscle is relaxed, or to prove that into our present understanding of the cause of the emptiness of the rectum a third sphincter muscle does not enter as a necessary element, but that the true explanation of the condition lies in the anatomy of the sigmoid flexure, which, by its large size, great capability of expansion, loose mesenteric attachment, and position, is peculiarly fitted to act the part of a reservoir.

Nor does the phenomenon of retention of fæces after the destruction of the anus and its muscles necessitate the belief in a superior sphincter. So far as our reading goes, no one has as yet attempted to prove the existence of a fourth sphincter in the ascending colon; and yet the same control over the passages which has been noticed after extirpation of the anus, and has been supposed to indicate a third sphincter, has been observed to follow an artificial anus in the transverse colon.[1]

There are several ways of accounting for the slight control over the evacuations which many patients are found to have after extirpation of the anus, apart from the existence of a third sphincter or of the valves of the rectum. Indeed, the physiology of the act of defecation itself, which we have just described, goes far to explain why there should be a certain warning of an approaching evacuation, and this is what is generally meant when the patients are reported to have a certain amount of control over the movements. The control will be found in most cases to mean rather a consciousness of an approaching movement, a warning given in sufficient time to allow the patient to make necessary arrangements, than an ability to absolutely prevent the evacuation which is about to take place. Of actual control there is little, because the sphincter muscle, whose duty it is, under the power of the will, to prevent an evacuation, is absent. To the performance of this duty a healthy sphincter is abundantly equal, as every one has the chance to prove on his own person; and it is this ability to delay and postpone an evacuation of the bowels, rather than a constant action in preventing the escape of fæces which are ever ready to escape, which best expresses the true function of the muscle. After extirpation of

[1] The case was that of Fine, of Geneva, in 1797. "He formed an artificial anus, by which the fæcal matters escaped, not continually, but once or twice a day only, and with a sensation of impending necessity which gave the patient time to make the slight preparations necessary to avoid soiling herself."—Manuel de Méd. Pratique de Le Louis Odier, de Genève, 2me éd., 1811.

the anus, this one element of natural defecation is destroyed, but several others are left. The fæces tend to remain by their own consistence unless actively urged forward by the peristalsis of the bowel; and this peristalsis is not constant, but recurs periodically. The relative increase in the muscular elements in the rectum tends to keep it closed and empty until fæces are forced into it from above. Again, the pressure of the fæces, owing to the S-shaped form of the rectum, is not in the direction of the axis of the tube, but constantly against the wall, and at the points of greatest curvature the resistance is greatly increased. To these let us add the contraction of the cicatrix after extirpation, and the natural redundancy of the mucous membrane which may block up the new anus by an actual prolapse, together with the voluntary sphincteric power of the levator, and we have the factors which account for the clinical fact of control so often seen. On the other hand, the constant escape of fæces, which *at first* almost always follows these severe surgical operations upon the rectum, is best explained by the irritation of the wound and the constant reflex action which it excites.

That the folds of mucous membrane, such as have been described, are of the nature to form an obstruction to the passage of the fæces, would seem to admit of no reasonable doubt. But this obstruction is passive and not active, and is by no means sphincteric in character. When it is sufficiently great to form a real obstruction to the descent of fæces, the condition is an abnormal one, but such a condition is sometimes seen, and is one which is not to be disregarded in the pathology of stricture of the rectum.

From a study of the literature of this question, and from the results of dissections and experiments which we have personally been able to make, we are led to the following conclusions:

1. What has been so often and so differently described as a third or superior sphincter ani muscle is in reality nothing more than a band of the circular muscular fibres of the rectum.

2. This band is not constant in its situation or size, and may be found anywhere over an area of three inches in the upper part of the rectum.

3. The folds of mucous membrane (Houston's valves) which have been associated with these bands of muscular tissue stand in no necessary relation with them, being also inconstant, and varying much in size and position in different persons.

4. There is nothing in the physiology of the act of defecation, as at present understood, or in the fact of a certain amount of

continence of fæces after extirpation of the anus, which necessitates the idea of the existence of a superior sphincter.

5. When a fold of mucous membrane is found which contains muscular tissue, and is firm enough to act as a barrier to the descent of the fæces, the arrangement may fairly be considered an abnormality, and is very apt to produce the usual signs of stricture.

CHAPTER II.

GENERAL RULES REGARDING EXAMINATION, DIAGNOSIS, AND OPERATION.

To one who has been trained in the habit of making a diagnosis before undertaking treatment it seems superfluous to insist upon the necessity of a physical examination in cases of rectal disease. The majority of patients who seek advice for this class of troubles come to the surgeon with the diagnosis of piles or fistula ready at hand, and, I am sorry to say, many of them come with the authority of some physician for that diagnosis, in whom, nevertheless, the merest inspection is sufficient to prove the existence of much more serious, and often of incurable, disease. This is not due to ignorance, but to carelessness ; to too great faith in the statements of the sufferers, and often to a false modesty on the part of the practitioner which leads him to accept such statements in lieu of a thorough examination.

The symptomatology alone may be of great value in the diagnosis of rectal disease ; it is almost never sufficient in itself for a diagnosis. There is a train of symptoms common to almost all diseases of this part, and which infallibly point to trouble of some kind, but they do not tell what that trouble is. The pain of a fissure is sometimes almost diagnostic, but it does not tell what troubles may be associated with the fissure ; and so it is in every other affection. For this reason the practitioner who attempts to treat a case of disease of the rectum without first making a direct examination, uselessly risks his reputation as a diagnostician ; and in my own practice I am guided by the simple rule that patients, male or female, who have not yet come to the point which makes them willing to submit to an examination, have not yet reached a point which admits of treatment. An examination, especially in women, is sometimes, though not often, difficult to obtain, and the dread of it keeps many sufferers from seeking relief ; but still the rule I have laid down is the only safe one, and the surgeon who allows

himself to be persuaded into "recommending something for piles" will sooner or later have a mistake in diagnosis laid to his charge, nor will the fact that he was moved by consideration for the patient's sensibilities save him from blame.

I generally find that, to one unaccustomed to the examination of patients suffering with disease of the lower bowel, the diagnosis is surrounded by many purely imaginary difficulties. This is shown by the fact that the first inquiry of almost all such practitioners is, "What speculum do you use?" as though there must be some mechanical contrivance by which the senses of touch and vision can be so improved upon as to render the discovery of obscure troubles much simpler than it otherwise would be.

The same idea is well fixed in the minds of patients who, under the false idea that an examination and diagnosis necessarily mean a painful use of instruments, will defer treatment until disease has made irreparable progress. The surprise of such patients when a diagnosis is made by mere sight, or at most by a painless digital examination, is only equalled by that of the young practitioner when he is told that only in exceptional cases is it necessary to use any instrument whatever.

The secret of successful diagnosis of these diseases consists in taking nothing for granted. Every affection of the lower four inches of the bowel can be both seen and felt, if the practitioner will only take the necessary trouble to go about it in the proper way; and a disease which can be felt and looked at is generally easy of diagnosis. The man who fails to detect the nature of a rectal trouble is generally the one who has refused to employ the necessary and yet simple methods by which alone a diagnosis can be reached; and the man who acquires a reputation as a diagnostician in this department is the one who simply uses his eyes and his fingers, and refuses to deceive himself by jumping at conclusions in the dark.

To one in the daily practice of any department of surgery a routine practice soon recommends itself as most likely to eliminate errors and lead to a correct conclusion; and the following is the one which has been adopted by myself, and the one to which every patient, great or small, male or female, submits.

The patient's name, age, condition in life, etc., are first entered in a case book. Next he or she is urged to tell the story of the disease in all its details, and this story is never interrupted or cut short; for in the nervousness of a first visit, often made at great expense of time and trouble, and with the fear of a pain-

ful examination before their minds, nervous patients will often begin the history of their sufferings backward, and if allowed to recover themselves by a few sympathetic words will not infrequently give the gist of the whole matter at the very end. This takes time, but time is never of any moment until the diagnosis has been made. It is often necessary to devote an hour or more to the first examination of a patient, but no patient should be allowed to end his first visit until a diagnosis has been made or the surgeon acknowledges to himself his inability to make such diagnosis.

By the time the patient has told the story the surgeon should be in the possession of certain information, and if not he must proceed by a few direct questions to try and obtain it. What he must know is this: How long has the patient been sick? Is there any pain; if so, of what character, and is it in any way dependent upon the evacuation of the bowels? Is there any protrusion of the bowels at stool; and if so, what is its character, and does it return spontaneously or is it necessary to replace it? Are the bowels regular, or is there diarrhœa, and of what character? Is there any bleeding? In addition it must be discovered whether there has been emaciation, febrile action, and discharge of any sort.

From such a verbal examination much may be gained. In fact, the positive diagnosis can sometimes be made. But, on the other hand, it is astonishing how often the most intelligent patient will utterly mislead the examiner; and, though I have great confidence in this indispensable history as a prelude to actual examination, considerable experience has taught me *never* to trust to it alone, for the simple reason that, although it may convey all the information necessary, the surgeon is never sure that he is not being unwittingly led upon a false track by the most intelligent answers his patient is able to give.

For example: A gentleman, whose medical fame has extended wherever medical literature is read, came to me some time since for "piles which had troubled him ever since he could remember." He was sure he had them when seven or eight years old, and an examination showed three very large fibroid polypi. Another told me he suffered only from severe pain at defecation, but asserted that "there never was any tumor to speak of." Of course I examined him for fissure, but none existed. Then, after an enema, he again placed himself on the table and showed a cluster of well-developed, prolapsing, internal hæmorrhoids, tightly constricted by the sphincter.

An intelligent young man, aged twenty-eight, tells me that ever since he was a child he has had rectal trouble the same as now. He never can remember when he did not pass blood and when his bowels were not inclined to be loose. Three years ago he was treated for piles by a quack, and so great was the benefit that for a time he supposed himself cured; but after a little while the trouble returned. He is no worse now than he has always been, and the symptoms are the same. Here was a perfectly clear history, pointing moreover directly to polypus, and for polypus I started to examine. He had epithelioma of about one year's growth, as near as could be judged from its development.

After this line of investigation has been exhausted, the inevitable examination by touch and vision follows.

General practitioners tell me they have difficulty in obtaining the consent of patients to an examination. I never have had, save once. That case was a foreigner, who told me, when I proposed it, that he "had entirely *too great a respect for me* to allow me to do such a thing." My only answer was that I had too great respect for myself to treat him without knowing what was the matter, and we parted amicably.

And yet an examination to a lady is not a pleasant thing. It is in fact a thing which will cause her to suffer silently for many years rather than submit to it. It is only when suffering has forced her to it that she will submit, but that point has always been reached when she consents to consult a surgeon or a specialist for treatment. Then she expects to be examined (in fact has very little respect for the surgeon if he does not examine), and it remains for him to make the unavoidable examination in the way least offensive to his patient.

I have often found that the best way to secure an examination in women was to resort to ether, with the understanding that whatever surgical procedure is thought advisable shall be performed at the same time. In this way a patient's sensibilities may often be spared, while both diagnosis and treatment are included in one examination.

For an ordinary examination of a lady a trained female attendant should always be in waiting. After the history has been taken and the physician has in a measure gained the confidence of his patient, she is handed over to the nurse in waiting, who gives the enema, arranges the patient on the chair, covers her with a sheet, and, when all is ready, signs to the doctor. His work may be done at a single glance, or may require careful

investigation and examination with finger or instruments; but when it is done the patient is again given over to the nurse, and when she is once more herself the diagnosis is made, and the question of treatment may for the first time be entered upon.

I do not know that it is necessary to dilate upon this point any further, except to say that I have found it best in my own

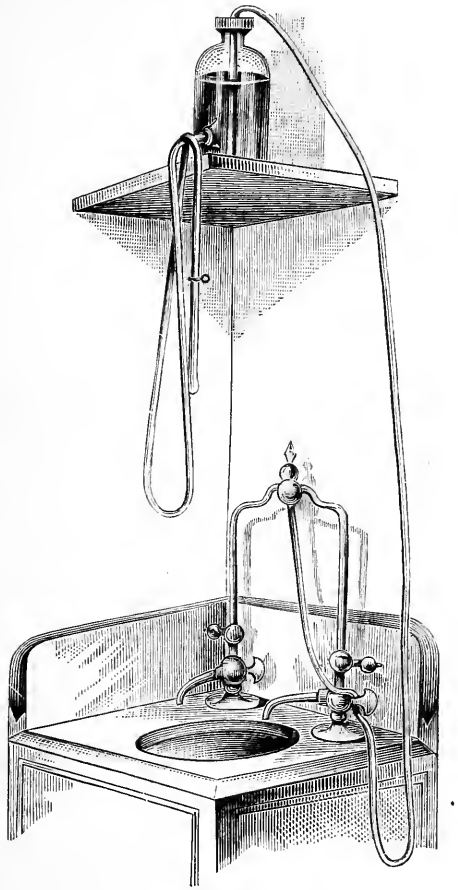

FIG. 12.—Apparatus for Injections.

practice to have two entirely separate waiting rooms, one for ladies and the other for gentlemen. It is pretty well known that all patients who come to me have rectal disease, and ladies do not care to take their turn in the presence of several gentlemen. I have also a special apparatus for the administration of enemata, and in immediate connection with the examining

room there should always be a retiring room and water closet. This is absolutely indispensable, both for decent privacy of the patient and for thorough examination.

The enema may be given in any way most convenient, but often requires great gentleness on the part of the giver. For my own use I have rather an elaborate apparatus (Fig. 12), consisting of a glass jar holding one gallon, which stands upon a shelf seven feet above the floor, and is filled by a rubber tube connecting with what is popularly known as a barber's faucet, by which either hot or cold water can be drawn from the same tube at pleasure. This, however, is useful for several other purposes besides the administration of an ordinary enema, one of which is hot-water irrigation through Skene's rectal irrigator, shown in Fig. 13. The temperature can be regulated by a thermometer placed in the jar, and the flow may be continued indefinitely without trouble.

FIG. 13.—Skene's Rectal Irrigator.

A small, smooth glass tube may often be introduced with less pain than the usual metal tip of the Davidson's syringe, and a small, soft-rubber catheter answers an equally good purpose; but whatever instrument is used should be either in the hands of the surgeon or of an intelligent nurse.

The examination may be made on any ordinary operating table, or on a more elaborate gynæcological chair, as the operator prefers. Since, however, there is a good deal of gynæcological work to be done in connection with this specialty, the patient should be enabled to assume Sims's position with ease. For a rectal examination alone, in male or female, the left lateral position is the best, and the correct Sims's position is not necessary. Either natural or artificial light may be used. For many cases there is little choice between the two, but for illumination within the rectal pouch artificial light has the advantage. For this reason I have long been in the habit of using a large and powerful lamp and lens, such as is used for laryngological examinations, and is figured in the cut. (Fig. 14.) Such a lamp may easily be fitted with an electric light, if desired.

The small incandescent electric lights to be introduced into the bowel are of little use for ordinary examinations, because, without ether and stretching of the sphincter, the lamp and speculum fill up the entire space and nothing can be seen, but under favorable conditions with a widely dilated anus they may be of great practical advantage.

A better form of electric light is that manufactured by the "U. S. Electrical Co." and shown in the cut. (Fig. 15.) It has

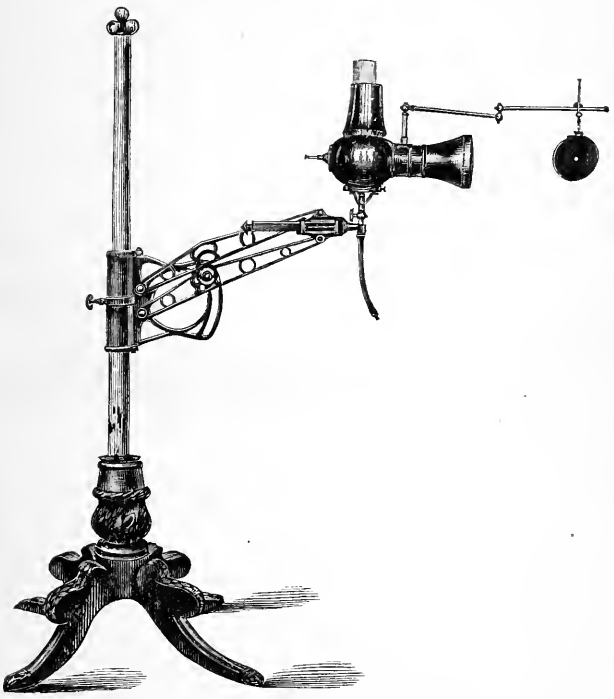

FIG. 14.—Lamp for Rectal Examination.

this advantage, that it is portable and is never obstructed by the head of the operator in his motions to obtain a good view.

A very convenient means of obtaining light at the patient's home or at night is the burning of a strip of magnesium, and it is a good plan to have a sufficient quantity of this in the operating bag for emergencies.

A simple inspection of the anus and adjacent skin and mucous membrane is often sufficient for a diagnosis, though it should never be trusted to alone. External hæmorrhoids, and internal ones when brought down by the use of the closet or

enema, external fistulæ, ulceration, skin diseases, many venereal affections, pin-worms, abscess, and fissure, may all be recognized in this way. A glance at the anus, too, may indicate to the practised eye the existence of serious disease within the rectum proper, for a discharge may flow from it which marks ulceration above, and it may be relaxed and patulous from over-distention or partial destruction of the sphincter. A sunken condition of the ischio-rectal fossæ, and a retracted anus surrounded by a profusion of soft, fine hair, may also properly excite a suspicion either of grave rectal disease or of some constitutional affection which is causing emaciation.

By using gentle force in pulling the anus open with the fingers, the mucous membrane may be everted to a considerable degree, especially if the patient can be brought to assist by an

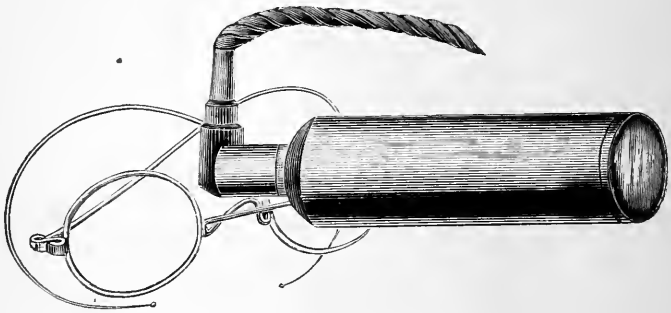

Fig. 15.—Electric Forehead Light.

effort at bearing down. In this way a fissure may almost always be brought into view without the use of a speculum of any sort, and the internal opening of the great majority of fistulæ may be reached, with a good view of the radiating folds and lacunæ.

Suppose now that the patient has described a distinct protrusion at stool, but when the enema has been given, and the surgeon comes to examine, no such protrusion is visible or can be brought into view by any effort of the patient. It has simply "gone back." Under these circumstances I cannot too highly recommend an examination with the finger while the patient is straining in the ordinary position of defecation. Under these circumstances the expulsive effort has the greatest possible effect, and a slight protrusion often becomes perceptible to the touch which cannot be seen with the patient in the lateral position on a table.

Suppose, again, that the enema has been given, the patient is

in position, and there is no protrusion, no opening of a fistula, no fissure just within the anus, and no capillary hæmorrhoid (to be described in the next chapter). In fact, no disease is manifest.

The next step is the digital examination of the rectum. With the patient on the left side, the right index finger should be used to examine the posterior wall, and the left for the anterior wall, so that the whole rectum may be felt by the palmar surface of the finger.

The condition of the sphincter muscle is first to be noted. Its resistance should be overcome by a slow and steady pressure with the ball of the finger, and not by a sudden exertion of force, for such an attack is always met by increased contraction. The force of the muscle will be found to vary greatly in different people. In the aged or debilitated it is lax; in the strong and healthy it is the opposite, and the finger can scarcely be passed

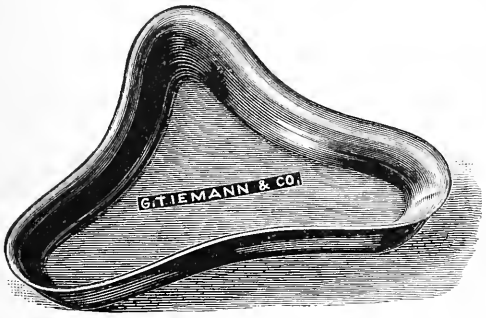

Fig. 16.—Hard Rubber Pus Basin.

through it without great pain and sometimes a slight laceration of the tender mucous membrane. When inclined to spasmodic contraction, as it sometimes is in persons of nervous tendency, a satisfactory examination may be impossible without the use of ether, on account of the pain.

Unless an obstruction is encountered, the finger may be carried up the bowel its full length, and pressed as far as possible beyond this point. Additional distance may be gained by passing the three remaining fingers backward along the inter-gluteal groove, instead of closing them in the palm as is generally done, and pressing the knuckles against the soft parts ; for the knuckles prevent the full passage of the index finger. An inch more may be gained by having the patient stand up and strain down upon the finger in the bowel.

In this way three and a half or four inches of the rectum

may be carefully explored, together with the prostate, the neck of the bladder, the uterus, and the anterior surface of the coccyx and lower part of the sacrum. With an exceptionally long finger it may even be possible to feel the vesiculæ seminales and vasa deferentia. In other words, all that part of the bowel which is most subject to disease is brought within reach. But after this is done the examiner may be no wiser than before, for to appreciate fully the condition of the rectum by the sense of touch alone requires a facility in this method of exploration which most practitioners never attain. In the majority of cases a digital examination will be made to discover whether or not the patient is suffering from internal hæmorrhoids ; and in the majority of cases also the examiner will be no wiser on this point after than before, for a soft internal hæmorrhoid is a difficult thing to detect by the finger alone, being readily mistaken for the natural mucous membrane of the part, especially when the latter is abundant and gathered into folds, as it is apt to be.

Ulceration is another condition which it is sometimes difficult to detect, especially when superficial and not attended by much induration ; and so is the opening of a blind internal fistula ; and yet, so well educated may the finger become that other methods of examination may be almost completely discarded. To carry diagnosis to this point it is first necessary, by oft-repeated examinations, to become perfectly familiar with the feel of the normal bowel. After this knowledge has been gained, a gentle sweeping of the ball of the finger over the whole inner surface of the lower three inches of the rectum will detect any change in it however slight. I wish it were possible to describe plainly the different sensations which are conveyed by the different pathological conditions, but this is a thing each practitioner must learn for himself by practice.

A stricture of small calibre cannot easily be mistaken, though one which admits the finger without constricting it may easily be overlooked. A stricture small enough to engage the end of the index finger firmly, marks the limit of safe digital examination, and the finger should not be forced through it for the sake of feeling what is above, for an attempt to do this has been followed by a fatal rupture of the bowel. In case of a tumor of any kind, advantage may be taken of conjoined manipulation through the vagina in the female ; but these are the troubles most rarely met with and most easily diagnosticated when encountered. The cervix or fundus of the uterus, when pressing upon the bowel, may be distinctly felt with the finger in the rectum, and

may deceive the unwary into a diagnosis of a new growth. The prostate may do the same. The different varieties of ulceration have each their peculiar and often diagnostic feel.

For examination by the sense of touch above the reach of the finger, recourse may be had to bougies. Of these there are two forms which are of value. One is the red, soft-rubber instrument with tapering and slightly bulbous point, shown in Fig. 17. This is made in twelve sizes, and for diagnosis a No.

Fig. 17.—Soft-Rubber Bougie.

7 is about the best. They are perforated to allow of the injection of water through them.

Another useful form of instrument is shown in Fig. 18. The conical tip should be of hard rubber, and the shank of pewter or copper to give flexibility. These are also made in several

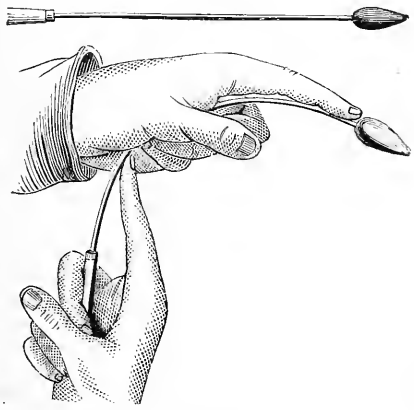

Fig. 18.

different sizes. They are decidedly more difficult to pass than the soft-rubber ones, but when facility in their use has been acquired they are more accurate in diagnosis.

The old-fashioned red, hard-rubber bougie is unnecessarily stiff and dangerous, and should be discarded, having no advantages over the softer ones either for the purpose of diagnosis or for that of treatment. The better fitted a bougie is for being forced through a stricture, the more dangerous it is.

These instruments are all used for the same purpose—that of feeling for a stricture located above the reach of the finger; and with any of them the unpractised hand will generally detect an obstruction in the perfectly healthy bowel at about four inches from the anus. I have had patients in whom I have never been able to pass any sort of a bougie without first injecting the rectum, no matter what manœuvring I resorted to; and I have seldom told a student to pass a rectal bougie that he did not at once discover a stricture. To pass a bougie into the rectum is rather a more difficult operation than to pass one into the urethra, the triangular ligament in the latter being replaced by the curves, the folds of mucous membrane, and the promontory of the sacrum in the former. Independent of Houston's valves of mucous membrane, it is not improbable that a slight degree of invagination of the upper into the lower part of the rectum may often exist, and into the sulcus formed by this condition the point of the bougie may easily pass. For the sake of overcoming these folds of membrane, the most minute directions have been given as to how the bougie should be introduced and gently urged along each successive inch of the bowel [1] by changing its direction and manipulating the handle. But such rules are of little value, for the simple reason that the obstruction is seldom of the same kind or in the same place in two different persons. Esmarch [2] gives the good general rule that the patient should lie on the left side, as the chief and most constant fold of membrane, the plica transversalis recti of Kohlrausch, projects from the right wall. The instrument should be passed gently, for force is never allowable here more than in the similar operation on the urethra; and when an obstruction is met with, the handle should be gently rotated, withdrawn, and again passed onward till by frequent repetitions of this manœuvre it is made to pass. If this does not suffice, a Davidson's syringe may be attached to the lower end of the bougie and a stream of warm water thrown into the bowel until it is moderately distended, when the bougie will generally pass with ease.

For measuring the extent of a stricture there is no better instrument than the *bougie à boule* in a delicate hand.

For the purposes of exact clinical study and report, a scale such as is shown in the cut (Fig. 19) should always be at hand for measuring rectal bougies.

[1] Houston: "Dublin Hospital Reports," vol. v., 1830.

[2] "Die Krankheiten des Mastdarmes und des Afters," Pitha und Billroth's "Chirurgie."

I have been using for some time a set of bougies exactly similar in make to the soft-rubber ones, but six instead of twelve inches in length. They are adapted for the patient's own use when prolonged dilatation is necessary, and are much safer than the long ones. I see by the last edition of Cripps's work on cancer that he has also utilized the same idea after extirpation of the rectum.

In case disease actually exists high up in the bowel, the attempt to pass an instrument is full of danger. A patient may easily recover from a false passage made in the urethra, but such will seldom be the case with the rectum, for here when the instrument leaves the bowel it enters the peritoneum. To understand this danger it is only necessary to remember that the bowel is generally ulcerated both above and below the seat of the constriction, and is sometimes weakened to such an extent

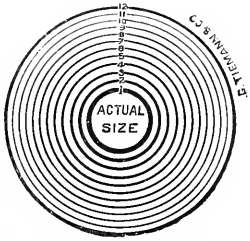

Fig. 19.--Scale of Rectal Bougies.

that it will allow a bougie to pass through it without the use of any appreciable force on the part of the surgeon. The bowel may also be lacerated without being directly perforated by the bougie, for the stricture may be pushed upward or dragged downward on the point of the instrument till the bowel gives way.

Supposing, now, that a rectal bougie cannot be passed eight or ten inches up the bowel, is it safe on this account alone to make a diagnosis of stricture high up? I should hesitate long before doing so, and should make many careful attempts to pass the instrument at different times, resorting to ether if necessary, carefully exploring through the abdominal wall for induration, and watching for the usual signs of obstruction. There are one or two points worthy of remembrance in this connection. The first is that the obstruction due to a stricture will always be at the same point in the canal; and another is that when a bougie has once become engaged in a stricture it is

firmly grasped, and the resistance to its withdrawal is equal to that encountered in introducing it farther. The feeling conveyed to the hand under these circumstances is diagnostic, and is like that which is felt when the effort is made to withdraw a sound from the grasp of a stricture in the urethra.

And yet the value of this means of exploration is very great, and although a bougie may pass a stricture without detecting it, successive failures to get an instrument through into the sigmoid flexure would, in my own practice, lead me to diagnosticate an obstruction.

Let us suppose now, once again, that all this has been done and yet the examiner has discovered no disease. At this point he must take a decided responsibility, for if, from the patient's history, he believes that rectal trouble exists, he must still go on and find it; but if he has no reason to believe this, he may abandon the search at this point and commit himself to the opinion that there is no rectal disease.

If he decides to go still further, there is but one line of investigation to be followed, and this consists in the administration of ether, the dilatation of the sphincter, and the use of the speculum, or else in exploratory laparotomy.

It will be noticed that up to this time the question, "What speculum do you use?" has not been answered, and for the reason that up to this point in the examination I use no speculum; and as the vast majority of examinations will lead to a diagnosis before this point is reached, it follows that in about ninety per cent of all my rectal cases I use no speculum at all.

An entirely too exalted idea of the value of the speculum exists. For ordinary examinations it is unnecessary, and the diseases which cannot be detected by the routine practice already described will not very often be detected by the simple use of any variety of this instrument. So strongly has this experience been impressed upon me that I have abandoned the use of every form of speculum *for ordinary diagnostic purposes*, unless at the same time its auxiliary means can be employed—the administration of ether. With ether, a light, and a speculum, a diagnosis may often be made which would otherwise be impossible; but to use a speculum without ether, for the purpose of exploring the rectal pouch, is merely in the vast majority of cases to inflict useless suffering.

This does not apply to the question of treatment, but simply to diagnosis. For there exists a certain class of diseases, notably circumscribed ulcers, which, when their situation is accu-

rately known, can be brought into the field of vision by a speculum and thus treated by direct applications ; but this is a very different matter from taking a patient who complains, perhaps, of but the single symptom of rectal pain, introducing some variety of speculum by which only the most imperfect view can be obtained, and because nothing is discovered (as in the vast majority of cases nothing will be), pronouncing the patient free from disease.

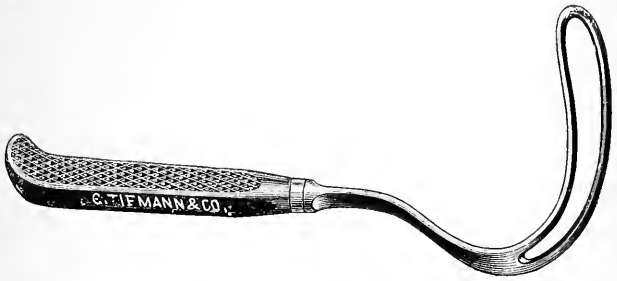

Fig. 20.—Author's Retractor.

I cannot make this point any stronger, perhaps, than by adding that whatever success I may have gained as a diagnostician in doubtful cases of rectal disease has come from the simple rule of etherizing my patient, dilating the sphincter, and then looking at what at once becomes plainly visible, viz., the whole

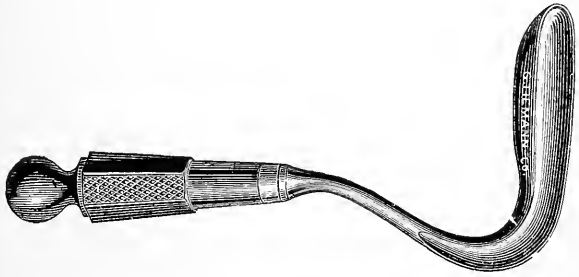

Fig. 21.—Helmuth's Speculum.

lower five or six inches of the bowel. Under such circumstances the simpler the instrument the better. A medium-sized blade of Sims's vaginal speculum answers every purpose, though Van Buren's modification has a great advantage, the notch allowing a very much larger surface of the bowel to come into view. Helmuth's modification of Van Buren's is better with ether than without, the club-shaped end rendering it harder to introduce. (Fig. 21.) My own, as shown in Fig. 20, is simply a strong fenes-

trated retractor which I have found very useful in major operations.

It will still sometimes be necessary to try and see into the rectum without ether or an assistant to hold a speculum. To meet this want I have myself added one more to the number of these instruments, made after a pattern suggested to me by Dr.

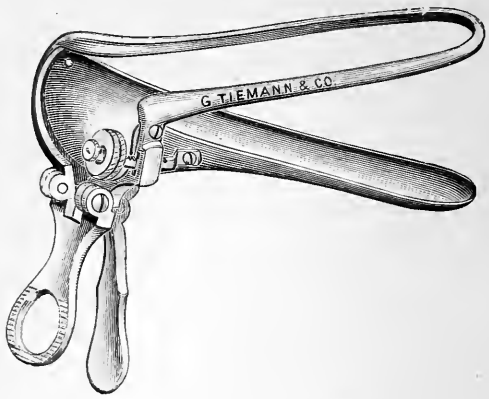

FIG. 22.—Author's Speculum.

Sass, and shown in Fig. 22. It is one which I use especially for office work without an assistant, and it has certain advantages. It avoids the especial objection to all the two- or three-bladed instruments, which is that the blades separate at almost an equal distance along their entire length, and that an equal amount of

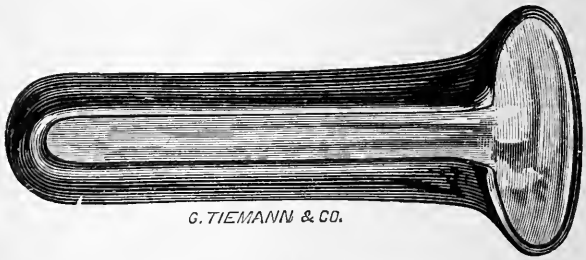

FIG. 23.—Fenestrated Speculum.

dilatation is therefore brought to bear both upon the anus and rectum—an amount which, when brought to a degree which is unbearable at the anus, has still done no good within the rectum. With this instrument the hinge is at the anus and the dilatation at the other end of the blades, and in a patient with a lax sphincter the instrument can sometimes be opened to a considerable

extent, and permit of an inspection of a considerable part of the bowel without stretching the anus enough to cause much suffering. The fenestrated blade must be made of steel to give it sufficient strength. It is an instrument, however, much more useful for treating an ulcer within the rectum, the exact seat of which is already known, than for finding the ulcer in the first place.

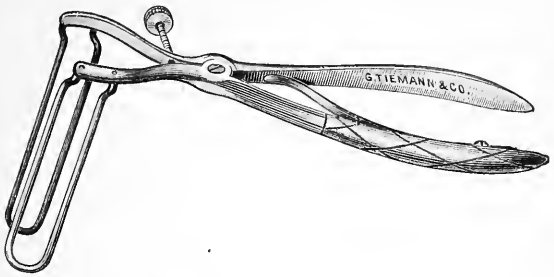

Fig. 24.—Sims's Rectal Speculum.

The fenestrated instrument, Fig. 23, is sometimes useful for inspecting the parts just within the anus; and a long, cylindrical vaginal speculum, with the end cut at such an angle as will best expose the mucous membrane, may sometimes be of service in bringing into view a small portion of the inner surface of the bowel high up. But, after all have been tried, none will be found better for any purpose than a small-bladed Sims's vagi-

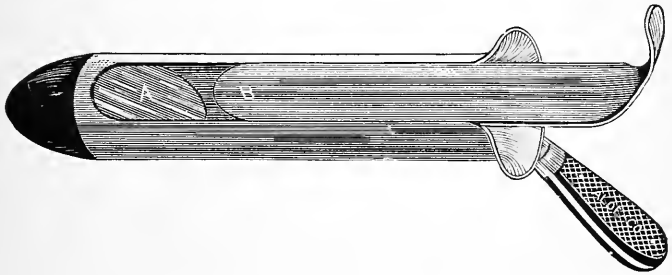

Fig. 25.—Aloe Speculum.

nal speculum, and without ether all will be found eminently unsatisfactory.

Almost the only other speculum besides these which I have found of any practical value is the bivalve invented by Sims for the rectum. This is particularly valuable for operations, and of little use without ether. It gives a better view of the whole rectum under the former circumstances than any other instrument. The one which I use is made an inch longer in the blades

than the original, and this measurement may in some cases even be increased with advantage.

In a few rare cases—such, for example, as small, blind internal fistulæ, or small spots of ulceration—advantage may be taken of the reflected image seen on a mirror through a fenestrum in the speculum. The Aloe speculum shown in the cut answers this purpose admirably, and I have been able to detect by its use disease of this kind which could not be seen in any other way as well, except by etherizing the patient.

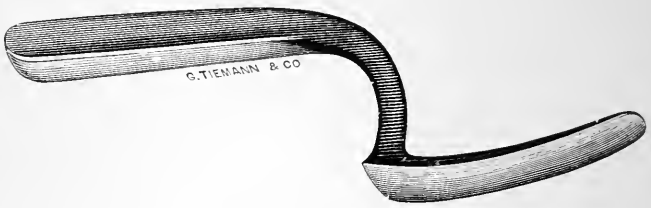

Fig. 26.—Rectal Depressor. (Van Buren.)

In connection with a speculum a depressor is often very useful. Many of these have been made. Fig. 26 represents one made by Van Buren; but the ordinary uterine depressor shown in Fig. 27 answers as well as any.

The stretching of the sphincter is in itself an entirely harmless proceeding, but one which necessitates the previous administration of ether. It should not, however, be done, as was at one time the usual method, and as it is often done at present, by introducing the thumbs back to back, and forcibly and suddenly separating them till they touched the tuberosities on each side.

Fig. 27.—Uterine Depressor.

In this way the mucous membrane is often lacerated at one or more points, and the paralysis is not as effectual as when the stretching is done more gradually. A better way is to introduce first one finger, then two, and finally four in the form of a funnel, and gradually bore into the anus; or to introduce two fingers and make pressure on all sides of the opening till it becomes patulous. Instead of one or two seconds, this procedure should occupy five minutes, and should be done so gently as not to lacerate the mucous membrane. The dilatation should also be

made to include the internal as well as the external muscle. If this dilatation be carried to a sufficient extent, the firm, cord-like feel of the external sphincter may be made to completely disappear. The paralysis induced in this way is always temporary, and I have never but once known it to be followed even by a temporary incontinence of fæces. After coming out of the ether, the patients are usually conscious of only a sense of soreness in the part, but are never incapacitated for their usual duties. This stretching of the sphincters is a necessary preliminary in almost all operations within the rectum.

From what has been said it may readily be seen that the diagnosis of stricture above the reach of touch or vision is a difficult matter. So difficult is it in some cases that no less an authority than Syme has written that there is good reason to suspect the honesty of a man who pretends to detect such a condition. Such is indeed the case; for "strictures high up" are favorites among a certain class of quacks, and the passage of a bougie two or three times a week for an indefinite period is profitable business. In reality strictures above the rectal pouch are rare; when they exist they are usually malignant, for this part of the bowel is not subject to the influences which, by exciting ulcerative action, result in the cicatricial contractions which so often affect the lower three inches of the rectum; and malignant disease of the sigmoid flexure or descending colon will manifest itself by a well-marked train of constitutional and local symptoms, and can generally be felt better through the abdominal wall than *per rectum*.

After the use of the bougie, which is at best an uncertain means of diagnosis for this condition, and after a study of the symptomatology and a careful examination through the abdominal wall, there is still one other means of exploration open to the surgeon if he have a sufficiently small hand—the passage of the whole hand into the rectum. A hand which measures seven and a half inches in circumference can generally be passed easily; one measuring more than nine is unfit for the purpose. With a small hand there is no danger of permanent incontinence of fæces, but the sphincter should be dilated gently and gradually, rather than forcibly torn open.[1]

[1] Dr. R. F. Weir (New York Medical Record, March 20th, 1875) was led to the following conclusion from his investigations of this subject: "A hand of less than 26 cm. may be introduced 17–19 cm. without inconvenience, but not more." His measurements showed the greatest circumference of the rectum to be at 6 or 7 cm. from the anus, where it may reach to 25–30 cm. At the upper part of the middle

When the anus has been sufficiently dilated to allow the hand to enter the rectum, if the bladder is empty the arch of the pubes may be felt above the prostate; if full it will be easily distinguished at the same point. The uterus and ovaries are easily made out anteriorly, and the whole curve of the sacrum may be followed posteriorly. The next point to feel for is the spine of the ischium on either side, and with this as a guide the greater and lesser sciatic notches may be outlined. The whole brim of the pelvis may be traced, and the external and internal iliac arteries followed with the fingers. All this may be done while the hand is in the rectal pouch, and it may be done upon almost any patient, male or female, though more easily upon the female, and with a small hand, without causing any unpleasant after-results. But in many persons this is all that can be gained by this method, for the anatomical reason that to pass the hand above into the sigmoid flexure is often attended with great danger from the narrowing of the bowel at this point. When the hand is met by a sense of constriction at about the level of the third sacral vertebra, where the lateral fold of Douglas is reflected from the bowel, the limit of examination has been reached, and no force should be used to overcome the constriction, which can only be accomplished by a rupture of the peritoneal coat. In many cases, however, by carefully following the natural windings of the canal, and by a semi-rotatory movement of the hand, combined with alternate flexing and extending of the fingers, this point of danger may be surmounted and the hand be passed fairly into the sigmoid flexure, and sometimes into the descending colon. Here the common iliacs, the bifurcation of the aorta, the left kidney, and, in fact, nearly all of the abdominal contents may be touched.

By this method of examination, a stricture situated in the sigmoid flexure, or even in the descending colon, may sometimes be discovered after all other methods of examination have failed; but, as we have shown, the method is not always appli-

third it is not more than 20–25 cm., and thence it rapidly diminishes, being not more than 16–18 cm. at the middle part of the superior third, while the narrowest part is at the commencement of the sigmoid flexure.

For an early case of manual exploration see "Medico-Chirurgical Transactions," vol. i., p. 129. Referred to by Copeland: "Observations on the Principal Diseases of the Rectum and Anus," London, 1814. See also G. Simon: "Ueber die künstliche Erweiterung des Anus und Rectum," Arch. f. klin. Chir., xv., 1, 1872; Dtsch. Klin. f. Chir., November, 1882; W. J. Walsham: "Some Remarks on the Introduction of the Whole Hand into the Rectum," "St. Bartholomew's Hospital Reports," vol. xii., 1876, p. 223.

cable, and the diagnosis of stricture high up still remains one of the most difficult things in surgery. In the great majority of cases in general practice in which such a diagnosis has been made, it may be proved false by the introduction of a full-sized bougie after a few trials, and in the remainder the diagnosis will be confirmed sooner or later by the well-marked symptoms of intestinal obstruction.

I have recently seen a case sent to me for examination by Dr. Janeway which illustrates particularly well the difficulties surrounding the diagnosis of this condition. The patient, a young medical man, apparently in robust physical condition, complained of occasional bloody passages and of pain deep down in the left iliac fossa, from which point he was convinced by his own sensations the blood came. The most careful examination failed to detect any lesion, and a medium-sized bougie was passed without difficulty. I was guarded in my prognosis, as was Dr. Janeway. At the same time I told him there was no way of making a diagnosis short of an explorative laparotomy. This I did not advise, nor would he have submitted to it in his good general condition ; but a few weeks later he died very suddenly of obstruction, and a post-mortem examination revealed a small, annular, malignant stricture at the junction of the rectum and sigmoid flexure.

From what has been said it must be evident to every reader that the successful examination of any doubtful case of rectal disease consists merely in making use of the ordinary senses, with which we are all provided. There is no occult faculty in all this, no deep power of knowing what is concealed from the majority of mankind. If the beginner will be honest with himself, and will insist upon seeing what is to be seen and feeling what is to be felt, he will—except for the experience which only practice can give—make as good a diagnosis in his first case as the specialist who has practised for a lifetime.

I can add nothing more to what has already been said on this point, except that the man who has foolishly allowed himself to be beguiled into prescribing some salve for a cancer, when he thinks he is treating hæmorrhoids, because his patient objects to an examination, need not feel hurt when he finds himself placed in a ridiculous light by some better man than himself who has made his diagnosis before beginning treatment. All his tender regards for the foolish susceptibilities of his nervous lady patient will bring him no mercy in her judgment. She is willing to admit that she may have been foolish, but she will

make no allowance for the foolishness of her physician, and in fact he deserves none.

There are but three ways of making a diagnosis—by question, by sight, by touch. The man who has exhausted these will seldom fail in his diagnosis, and, should he do so, need not be

Fig. 28.—Sponge Holder.

ashamed. The man who neglects any one of them will sooner or later make some error which he might easily have avoided.

The things necessary for daily office practice, besides the specula of various forms and the bougies, are a Davidson's syringe, ointment, cotton, sponge holders (Fig. 28), brushes (Fig.

Fig. 29.—Brush on Flexible Handle.

29), a cup for fusing nitrate of silver (Fig. 30), an applicator, of some metal easily bent, around the end of which cotton may be twisted (Fig. 31), towels, basins, etc.; and these should all be placed within easy reach of the hand. In the matter of probes almost every variety is useful, from the hard-rubber uterine

Fig. 30.—Cup for Fusing Nitrate of Silver.

probe to the finest wire of pure silver; and directors also should be of many sizes. A convenient case for these things, and for other surgical instruments, which is intended to stand on the floor by the side of the table or bed, is represented in Fig. 32.

Fig. 31.—Applicator.

This should also contain a pus basin, towels, ointments, solutions, etc.

Within the last few years many so-called "rectal cases" have been put upon the market, each supposed to contain all that is necessary for the rectal specialist. I have never arranged an operating case, for the reason that to hold all the instruments

necessary for any emergency that may arise it would necessarily be very cumbersome, and because I prefer to pick out whatever may be needed just before the operation and roll them in chamois. But the universal acknowledgment of the value of antiseptic precautions in all surgical work has rendered the preparations for any operations upon the rectum much more elaborate than formerly. No surgeon meeting with an unfortunate result after any of even the simpler operations would feel quite blameless had he neglected these precautions; and he certainly would

Fig. 32.—Instrument Case.

not be considered so by the profession at large. What is true of the minor operations applies with much greater force to the major ones. The possibilities of diffuse inflammation, to which the perirectal cellular tissue is peculiarly liable, and of blood poisoning, are always to be borne in mind and guarded against.

For this reason I have for greater convenience arranged a bag which is always ready, and contains, not the instruments for any particular operation, but the things which in addition to them are essential for every operation. I find that much time

and annoyance are saved by this expedient, especially if the bag is carefully rearranged after each time it is used, and kept always ready for the next.

The bag is arranged on the general plan suggested by Dr. Gerster, modified to suit the particular needs of rectal surgery; it contains:

1. Operating gown of white muslin, clean from the wash.

2. Two rubber sheets. One of these is a yard square to protect the carpet and hold an ordinary wash bowl, which can always be obtained in any house; the other is one and a half yards long by a yard wide, and is long enough to protect the bed and hang down into the bowl as a trough for blood and fluids. A special air cushion with apron attached has recently been invented for this purpose, which it answers well. The cushion forms

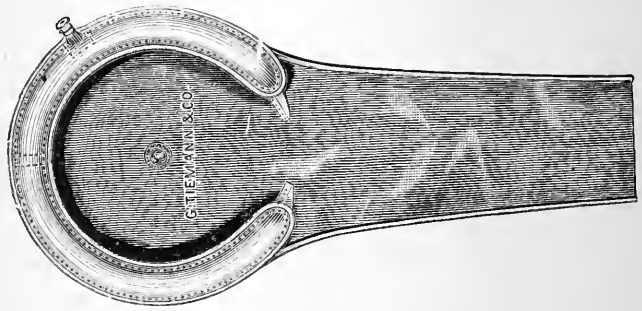

FIG. 33.—Air Cushion.

about three-fourths of a circle, and the apron hangs down to the floor.

3. Fountain syringe with a loop of strong cord attached to the metal ring at the top so that it can be hung on top of a door if nothing else is convenient, and plenty of rubber tubing to reach a considerable distance. This is for irrigating, and the bichloride solution is made from the tablets as wanted and of any strength required.

4. A Clover's crutch (Dr. Peters's modification).

5. Ether and inhaler.

6. Small bottle of pure carbolic acid (all glass bottles should be in metal cases to prevent breakage). Half an ounce of this to the pint of water, poured into a shallow dish, answers for immersing the instruments during the operation.

7. A small jar of carefully prepared sponges, each of which is thrown away after being used.

8. Long-handled sponge holders.

9. A rubber bag full of picked lint and bichloride gauze.

10. Iodoform in an insufflator with a long nozzle. This is much better than the hard-rubber sprinkling box, with which it is very difficult to carry the powder within the rectum.

11. Bandages and suppositories.

12. Small graduate.

13. Vaseline or carboline.

The things thus far enumerated are necessary for every cutting operation about the rectum, and although their preparation and use entail some little care and trouble, it will be more than repaid both in actual results and in the sense of security.

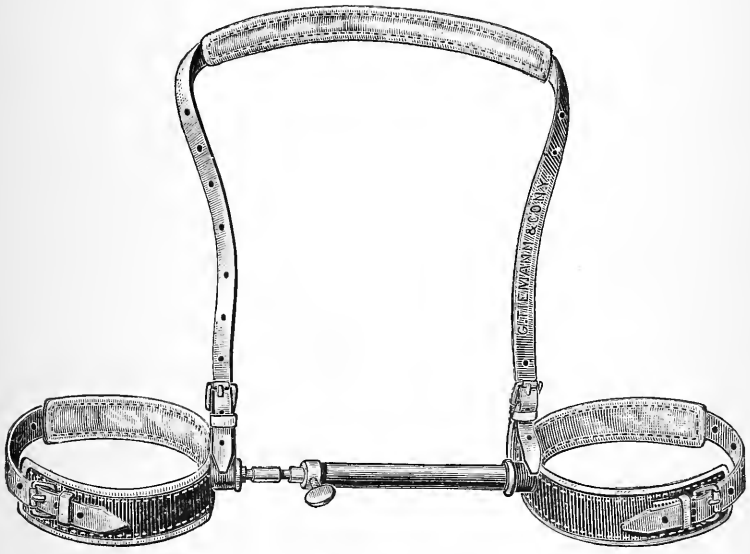

FIG. 34.—Clover's Crutch.

As the above-enumerated things are necessary for a simple operation, and only a few others are needed for a much more extensive one, the latter can easily be added when required; these are:

14. A jar full of drainage tubes of various sizes, kept in carbolic acid solution.

15. Bottles of catgut and silk sutures of all kinds. A very convenient arrangement for these is made by fitting a rubber cork tightly in a large-sized test tube, and attaching to the cork a bobbin divided into three compartments for different sizes of ligatures. (Fig. 35.)

16. A bell-shaped sponge with vulcanite tube and a bottle of dry subsulphate of iron, for packing the rectum in case of hæmorrhage.

17. Hypodermic syringe.

18. A small flask of brandy.

With this bag at hand the surgeon is ready for almost any emergency in rectal surgery. The cutting instruments, forceps, Paquelin cautery, *écraseur*, specula, artery forceps, etc., can be

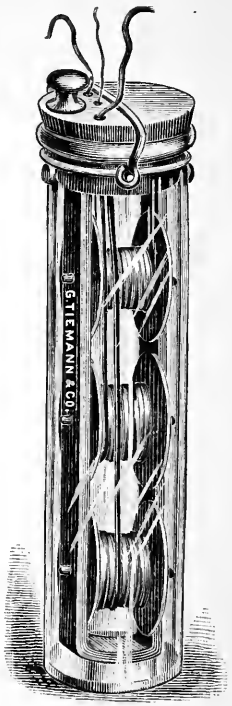

Fig. 35.—Bottle for Ligatures.

taken from their case and be ready for use in a very few moments.

The details of the antiseptic precautions suitable for the various operations upon the rectum will of course differ, but the general principles are the same as in other branches of surgery. Cleanliness, irrigation, and drainage cover nearly the whole ground. The same rules as to clean hands, clean instruments, and clean clothes apply to an operation for hæmorrhoids, fistula, or artificial anus equally with a laparotomy or an amputation of the thigh. Some of them are even more important here than

elsewhere. For example, sponges used on the rectum should not be used again. Grooved directors, artery forceps, and any instruments having teeth, as well as rubber sheets, operating gowns, and the points of syringes, are very apt to be contaminated with fæcal matter mixed with blood, and require special care in cleansing them. Again, any operation involving a division of the wall of the bowel, as fistula, proctotomy, or excision, carries with it the danger of cellulitis, and drainage is of perhaps greater importance here than almost anywhere else.

Before attempting any extensive surgical operation upon the rectum the bowels should be thoroughly emptied by a cathartic. It is well to begin with three compound cathartic pills or with five grains of mass. hydrarg. on the second evening before the operation, where the patient's general condition admits of these remedies; to follow them with a slight saline or a dose of castor oil on the night immediately preceding; and finally to clear out the rectum with a simple enema an hour before the operation. After this the bowels may easily be confined for a week, if desirable, without inconvenience to the patient, and the passage of hard masses of fæces over a wounded surface is avoided.

In all operations in which ether is used, two assistants will be necessary and four are preferable. Each assistant should have his place assigned to him—one for the anæsthetic, one to keep each leg of the patient in position and to hold the speculum, and one to assist the operator in whatever way may be necessary. A state of profound anæsthesia will generally be necessary, though with intelligent patients I have often taken advantage of the primary anæsthetic state which ether produces for opening abscesses, dividing fistulæ, and cutting off external hæmorrhoids.

Accidents are not common in operations about the rectum, but there is one for which the surgeon should always be prepared—hæmorrhage. For this reason a bottle of dry subsulphate of iron and a Paquelin's thermo-cautery should always be at hand. The thermo-cautery as now made (Fig. 36) is not at all cumbersome, and is exceedingly useful in many operations about the rectum. The bulb containing the sponge for the benzine should never be filled with an excess of fluid, which may run down into the point and interfere with the working of the instrument; and the platinum point should be *thoroughly* heated before the assistant begins to use the bulb to drive the air over the sponge. If proper regard be paid to these points the instrument is a most reliable one, and in every case where

hæmorrhage is to be apprehended it should be ready for use, and an alcohol lamp or gas jet should be ready to heat the point—a detail which is sometimes forgotten.

Hæmorrhage seldom occurs from the rectum after a surgical operation—so seldom as to be almost unknown—which cannot be controlled either by the ordinary methods or by the cautery and by packing the rectum. The rectum may be packed with either sponges or lint, and these may be used either with or without the subsulphate of iron. Most cases of bleeding may, however, be controlled by the use of simple ice-water and a moderate amount of pressure properly applied to the bleeding surface without the necessity for a systematic packing of the

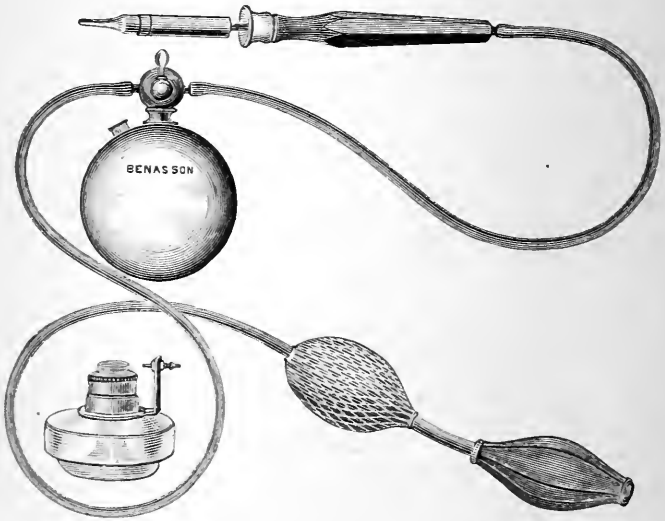

Fig. 36.—Paquelin's Thermo-Cautery.

whole rectal cavity. It is not long since I was called in the middle of the night to stop the bleeding from an incision which I had made into an abscess of the ischio-rectal fossa about eight hours before. I found, as is too often the case, that the patient was thoroughly immersed in a mixture of blood and persulphate of iron, which covered him from the pubes to the middle of the back and had thoroughly permeated the bed. On entering the room I was informed that the wound had been carefully stuffed with lint and persulphate of iron "several times," and that the case was undoubtedly one of hæmorrhagic diathesis. A case like this is easily managed. The treatment consists first of all in providing a good light, next in cleaning up the general nastiness,

then in finding the bleeding point and making pressure upon it. In this case the bleeding came from a small, spouting, cutaneous vessel, and was at once controlled by filling the incision I had made with picked lint *thoroughly* pressed home into the wound and leaving it there. Most cases of bleeding may be controlled in the same way, but where the hæmorrhage is within the bowel it is not always easy to make pressure upon the right point without packing the entire rectal cavity. For this purpose Allingham[1] recommends the following procedure, which is equally simple and effectual.

Take a medium-sized bell-shaped sponge and pass a strong double ligature through the apex from within outward and back again, so as to include a considerable part of the sponge in the bite of the ligature—enough so that when the cord is pulled upon strongly from below it will not tear out. After wetting the sponge and squeezing it out, it should be powdered with the

Fig. 37.—Canula for Packing Rectum.

subsulphate of iron and passed as far up the rectum as possible with the aid of a rectal bougie, the apex being upward. The whole of the rectum below the sponge should then be carefully filled with pledgets of cotton wool powdered over with the iron, each roll being carefully and firmly packed away. An exceedingly large quantity of cotton may be crowded into the rectum in this way, and when the cavity is filled the sponge should be drawn down by means of the string hanging out of the anus, so that the whole mass may be tightly compressed. If the bowel has been thoroughly emptied as recommended, such a plug may be left in for a week or more without causing any discomfort, and no bleeding can occur while it is in place. If, however, it is intended to leave the packing in for such a length of time, it is better to pass a large-sized, stiff rubber male catheter, or the metal tube made for the purpose (Fig. 37), through the apex of the sponge and pack the cotton around it. In this way

[1] Op. cit., p. 154.

a chance is given for wind and fluid fæces to escape. By this simple means, when properly used, any hæmorrhage after an operation upon the rectum may be controlled.

After operations upon the rectum or anus, a suppository of one grain of opium may generally be placed in the rectum with advantage, and the surgeon should always be provided with them. Those made of gelatine by Mitchell, of Philadelphia, have given me great satisfaction. They are smaller, softer, and less irritating than those usually made of cacao butter, and they withstand the changes of temperature better. The usual dressing consists in placing a pad of lint and a soft towel over the anus, and fastening them in place with a **T** bandage. This form of bandage will generally be found the best in any case where a continuous dressing is needed.

Wounds of the rectum will always heal more kindly when the patient is in the horizontal position than when standing or walking, there being less tendency to venous congestion in the former case. Almost any operation may result in a sluggish open sore if the patient be allowed to disregard this rule.

Retention of urine is of frequent occurrence after operations upon these parts, both in men and women, and it should always be in the mind of the surgeon. It is not generally of long duration, and it may often be overcome by a bath and hot applications without having recourse to the catheter. The following case conveys a lesson in this matter which should never be forgotten.

Case. *Death from Retention of Urine.*—I was requested several years ago by a gentleman to make an autopsy on his brother, who had died very suddenly and unexpectedly after being confined to his bed about a week with an ischio-rectal abscess near the anus. Before the abscess appeared the man had been in perfect health, and was apparently doing well up to the moment of his death, as the abscess had been opened on the day before, with great relief to pain, and was discharging freely. I made the autopsy, as requested, and found a bladder distended to the point of rupture, the urine dammed back upon the kidneys, which were gorged with blood, and the cerebral vessels greatly congested. The man had died very suddenly in a convulsion. A little questioning revealed the fact that from the first day of the disease there had been retention of urine with dribbling from the overflow, and that for the pain arising from this condition opium had been freely given up to the day of death.

Once during his sickness an old woman in the house had applied a hot flannel cloth over the bowels, and the patient had passed an immense amount of urine. The condition of the bladder seemed to have entirely escaped the notice of his medical attendant, as it probably has escaped the attention of most surgeons at some time, though, fortunately, without, as in this case, a fatal result.

With the discovery of cocaine it was thought that a new era had begun in rectal surgery, but the hope has been in great measure fallacious. Injected in quantities of five drops of a four-per-cent solution at three or four opposite points of the circumference of the anus, it is sometimes possible to dilate the sphincter almost painlessly for purposes either of exploration or operation. Twenty drops of the same solution thrown into the rectum will also greatly diminish the pain of any examination or operation within the canal, and this action can be relied upon with greater certainty than the former ; for it is sometimes difficult and practically impossible to do away with the sensitiveness of the anus to an extent sufficient to allow of painless stretching of the sphincter, without producing grave constitutional effects of the drug.

I remember one case in particular in which I found it impossible to do this without using an amount of cocaine which I considered dangerous. The patient was a strong, healthy young policeman with an ulcer—the mouth of a blind internal fistula—about two inches within the rectum; and in the attempt to reach this I injected about two drachms of a four-per-cent solution of cocaine at eight different points in the substance of the sphincter, producing full constitutional effects without reducing the local sensibility sufficiently to allow of the operation. The cocaine was finally abandoned and ether substituted. It was a case analogous to this that caused the Russian surgeon, some few years ago, to commit suicide after having caused the death of his patient with an overdose of the drug used for this purpose.

Practically I have derived the greatest benefit from this drug in small operations, such as cutting off external or prolapsed internal hæmorrhoids, incising fissures, etc., where the parts implicated do not cover too much area. Little or no benefit is to be expected from rubbing it on the skin of the anus. It should either be used subcutaneously or applied directly to the mucous membrane.

I have also done several operations for extensive hæmor-

rhoids with the drug, injecting each tumor separately and applying the clamp and cautery, and in these cases the drug may be used satisfactorily if it be not necessary to dilate the sphincter; but for dilating a tight sphincter painlessly by injections at different points in its substance, the drug has frequently disappointed me.

CHAPTER III.

CONGENITAL MALFORMATIONS.

The study of embryology has revealed the fact that the rectum and anus are developed separately, the former from the internal and middle layers of the blastodermic membrane, the latter from the external. The lower portion of the primitive intestine terminates at first in a cloaca common to it and the urachus. About the eighth week a partition is formed dividing this cavity into the uro-genital and the rectum, the partition being the perineum. At the same time a depression has been forming in the skin at the site of the anus and gradually extending upward to meet the blind rectal pouch. These unite about the end of the fourth week.

The malformations of the rectum and anus found at birth are due either to a failure on the part of Nature to form a depression in the skin sufficiently deep to meet the closed rectum above; to failure of the rectal *cul-de-sac* to descend sufficiently to meet the depression which is formed; or to an arrest of development of the tissues between the rectum and genito-urinary tract.

These congenital malformations have been classified by different writers into various groups. We shall adopt in the following pages that of Papendorf,[1] which is the one followed by Bodenhamer,[2] Mollière,[3] and Esmarch.[4]

1. *Narrowing of the Anus or Rectum without Complete Occlusion.*—A congenital stricture of the anus, or of the rectum at a point more or less removed from the anus, has been occasion-

[1] "Dissertatio sistens observationes de ano infantum imperforato," Lugd. Batav., 1781, 4to (Bodenhamer).

[2] "A Practical Treatise on the Etiology, Pathology, and Treatment of the Congenital Malformations of the Rectum and Anus," by Wm. Bodenhamer. New York: Wm. Wood & Co., 1860.

[3] "Traité des Maladies due Rectum et de l'Anus," par Daniel Mollière. Paris, 1877.

[4] Op. cit.

ally reported. Serremone[1] particularly insists upon congenital narrowness of the anus as a cause of fissure, and has himself observed such cases; and the same condition in the rectum is generally included among the causes of benign stricture.

The narrowing in these cases may be very slight, or may reach such a degree as hardly to admit of the passage of meconium. It is generally annular in form, resembling the contraction which would be caused by tying a tape tightly around the tube; though it sometimes involves a considerable extent of bowel, as in a case reported by Cheever (*British Medical Journal*, July 29th, 1886), where the narrowed portion above the sigmoid flexure was eighteen inches long and was impervious to solids. The child died of chronic intestinal obstruction after two years. There may be no symptoms caused by such a contraction, and the child may grow to adult life suffering only from obstinate constipation; nor do such contractions lead to the ordinary changes in the mucous membrane above and below the spot, which are usually seen in cases of stricture of the rectum. On the other hand, when the stricture is tight it will give rise to all the usual signs of such a condition in the child—absence of free passage of meconium, distention of the abdomen, and vomiting. The diagnosis is easily made by a digital examination, should the symptoms be sufficiently marked to lead the attention of the surgeon to the rectum; for the stricture is generally near the anus and may be felt as a ring with sharp edges.[2]

Such a case was sent to me for treatment in January, 1888, by Dr. Spitzka. The patient, a gentleman thirty-eight years old, was in very good health, except that he complained of always having been constipated and thought the trouble was growing worse instead of better. He never had been able to have a passage larger than his little finger, and recently he had been obliged to strain more than formerly to accomplish even this. On examination there was found at a point one and a half inches from the anus a falciform stricture not admitting the passage of anything larger than the tip of the index finger. This was nicked in several places so that the finger could be passed beyond the second joint, but it was very unyielding, and

[1] Inaugural Thesis, No. 555. Strasbourg, 1861.

[2] See also Gosselin, "Clinique Chirurg.," 3d ed., Paris, 1879, t. iii., p. 706. Bérard et Maslieurat-Lagemar, Gaz. Méd. de Paris, 1839, p. 146. Demarquay, "Journal de l'Expérience," t. ix., 1842, p. 273. Ashton, "Diseases of the Rectum," London, 1854, p. 27. Devilliers, Rev. Méd. de Paris, 1835.

nothing more than this could be gained without dividing all the thickness of the bowel; for the constriction was not due to a membranous partition which could be broken down, but to a narrowing of all the walls of the bowel which could only be overcome by proctotomy.

Trélat records a very interesting case of congenital stricture first diagnosticated at the age of fifty-two. The patient, a woman of vigorous constitution, free from all important manifestations of disease, in whom the most careful questioning failed to reveal syphilis, was subject to growing constipation. The passages, extremely difficult, were at first accompanied by a few drops of blood, then by decided hæmorrhage, and after a time by glairy mucus. Things had reached such a point that the pain and tenesmus, with the prolonged constipation, had affected the general health; and after a period of constipation lasting twenty-four hours, followed by a violent discharge, the patient decided to enter the hospital.

At the first examination it was easy to perceive the existence of a narrow contraction five cm. above the anus, with some irregularity of the mucous membrane, but no ulceration. This was evidently neither cancerous nor syphilitic, and after gradual dilatation, continued for some time, it was found to be a valvular contraction with healthy mucous membrane. Dilatation greatly relieved the patient.

The diagnosis of such a stricture is easy, its congenital nature being made plain by the absence of any disease which could cause it, and more especially by the absence of any associated ulceration or deposit in the adjacent parts of the rectum. The mucous membrane is perfectly healthy, and so are all the surrounding tissues; and the stricture has a thin, knife-like edge which is not seen in those of acquired origin.

How common this form of malformation may be will never be known till examinations of the rectum in cases of prolonged constipation become the rule instead of the rare exception.

The fact that a patient has lived thirty-eight years with such a condition as this, and only suffered slight annoyance, cannot be taken as any indication that the balance of his life will be equally comfortable; for after the period of middle age has been reached the local trouble may quite rapidly assume a graver phase. It is impossible to find many statements as to the ultimate results in after-life of congenital strictures in children. The symptoms which they cause are marked by various epochs. With some they occur in infancy, in others only after

thirty or forty years ; so that it is difficult at first to understand how such a lesion can exist so long in a latent state. Possibly, however, the fact may be explained in the light that a great many affections of congenital origin do not manifest themselves till late in life—for example, certain forms of tumors, and dermoid cysts in particular. On the other hand, in infancy and youth the tissues have no tendency toward contraction or induration, for this is the period of suppleness and elasticity. The function of defecation is carried on at this time much more easily than at a later period. Thus it can easily be understood that slight contractions do not constitute a serious obstacle to that function for a long time, but that at a certain period of life the modifications in the constitution of the tissues and functional intestinal troubles change the favorable conditions.

Congenital strictures are often accompanied by abscess and fistulæ at the lower end of the rectum, or they may end in time by setting up a periproctitis, extensive adenitis, or deep pelvic phlegmon. In one case quoted by Trélat, a peculiar hepatitis and interstitial nephritis caused the death of the patient.

The treatment of this form of obstruction consists either in gradual dilatation or in proctotomy. My own experience in these rare cases tends to the conclusion that gradual and systematic dilatation will accomplish all that can be accomplished. Nicking is of little use, for if dilatation does not relieve the obstruction it must be divided with the knife ; and in that case the whole wall of the rectum must be divided down into the perirectal cellular tissue.

2. *Closure of the Anus by a Membranous Diaphragm.*—The membrane in these cases may be of greater or less firmness and thickness, and may be composed of skin or of mucous membrane. It is sometimes so thin as to bulge out with meconium when the child strains or coughs, and has been known to rupture spontaneously. It is also occasionally perforated, like the hymen, and allows the escape of considerable quantities of meconium, thus tending to conceal the actual condition till the fæces become solid and actual obstruction takes place.

This is the simplest of all the forms of congenital malformation of the anus, and, unfortunately, one of the rarest. It is easily diagnosticated by simple inspection of the parts ; and the treatment consists in making a crucial incision through the membrane. The remains of the membrane, like those of the hymen, which it strongly resembles, will shrink up so as not to cause trouble or deformity. I know of one case where the use

first of a trocar and subsequently of the finger to dilate the opening thus made was followed by fatal hæmorrhage on the second day, though the child's life could probably have been saved had the surgeon been notified of the bleeding.

3. *Entire Absence of the Anus, the Rectum ending in a Blind Pouch at a Point more or less distant from the Perineum.*—In these cases there may be a slight depression at the point where the anus should be found; or there may be no trace of the anal orifice, the *raphé* of the perineum extending over the spot and back to the coccyx. The presence of a slight anal depression is not to be considered as an indication that the rectal pouch is

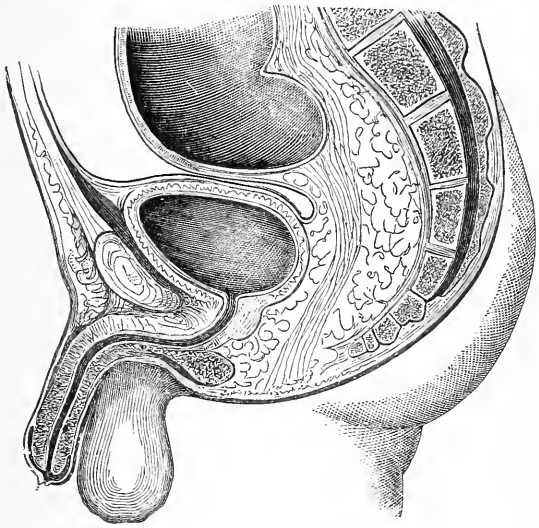

Fig. 38.—Rectum ending in a Blind Pouch. (Mollière.)

near the surface—in fact, some of Cripps's figures would seem to indicate exactly the reverse. The external sphincter muscle is also sometimes present and at others entirely wanting. The pouch of the rectum in these cases may hang loose in the pelvis or abdominal cavity, or be attached to some adjacent part; and the space between it and the perineum may be filled up with cellular tissue, or, in other cases, a distinct fibrous cord may be traced from the rectal pouch to the skin, as is shown in the plate. (Fig. 38.)

If the pouch of the rectum be not at too great a distance from the skin, a sense of fluctuation may be felt by firm pressure with one finger over the anus and the other hand on the

abdomen. In females, valuable aid in diagnosis may be obtained by the introduction of a finger into the vagina. The use of a stethoscope over the anus, and of percussion on the abdomen, have been recommended to detect the rectal pouch filled with gas (Bodenhamer, Mollière); and also the irritation of the skin over the anus to provoke efforts at defecation.[1] An effort should always be made, where there is complete absence of the anus, to discover whether the rectum may not have some outlet through the bladder or vagina, which shall place the case in one of the classes soon to be described.

4. *The Rectum may be the Same as in the Last Variety, and the Anus be Normal.* (Fig. 39.)—The septum which separates

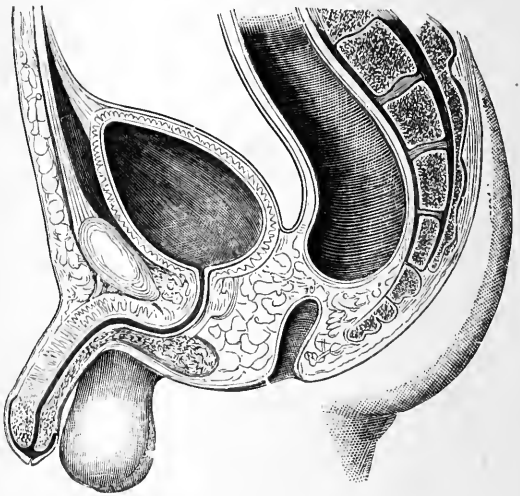

Fig. 39.—Rectum ending in Blind Pouch; Anus Normal. (Mollière.)

the rectal and anal pouches in this case is generally within easy reach of the anus, and may be so thin as to permit a sense of fluctuation. In most cases, however, the septum is thicker, and is composed of cellular or fibrous tissue, lined both above and below by mucous membrane. It may be perforated, like the hymen, at some point, and allow of the slow dribbling of meconium. There may also be more than one septum. Voillemier[2] reports one case in which the rectum was divided in this way into four distinct compartments, the upper one containing meconium and the others mucus. There is generally little difficulty

[1] A. Copeland Hutchinson: "Practical Observations in Surgery," London, 1826.
[2] Gaz. des Hôp., 1846.

in the diagnosis of these cases, provided only a digital examination be made when the infant begins to show the effects of the obstruction ; but the danger lies in the fact of the normal anus, which is apt to allay suspicion as to the true nature of the difficulty.[1]

In the diagnosis of the third and fourth varieties it is of the greatest importance to determine the position of the rectal *cul-de-sac.* Unfortunately this is seldom possible with any degree of accuracy. If the pelvis be of normal shape and the genital organs in the natural position; if on crying or straining there is a distinct protrusion in the anal region, then the probability that the pouch is within easy reach is strong. But the cases in which any protrusion or fluctuation can be detected, even by tickling the perineum, pressing upon the abdomen, or exciting the child to sneeze or cough, are very rare, and any attempt to cause a protrusion by the use of purgatives is utterly unjustifiable.

It has been recommended to delay operation for a day or two, if the symptoms are not very urgent, in order to give the rectum an opportunity to become more distended and prominent. Such advice is quite erroneous, as, in the first place, the meconium becomes less by the absorption of fluid, and—what is more important—while we are waiting the time may slip away when alone a chance of success exists.

Nearness of the tuberosities is often a sign that the rectal *cul-de-sac* is high up. Exploration by the bladder or vagina sometimes gives useful results ; for if the vagina or bladder fill up the concavity of the sacrum it is proof that the intestinal *cul-de-sac* is high up, and colotomy is indicated from the first.

I have quite recently had a case of this fourth variety at my clinic at the Post-Graduate Hospital. The child had reached nearly four years of age and was well nourished, but was suffering from chronic intestinal obstruction. The history was simply of constipation ever since birth, and of no passage for several days before coming to the hospital. Examination revealed what seemed to be a thin membranous partition at about

[1] "Dr. H. G. Jameson, of Baltimore (Medical Recorder, vol. v., 1822, p. 290), divided two membranous septa, one above the other, with a button-headed bistoury, which he passed 'into the opening or ring of the septum,' and with which he cut freely down toward the sacrum. This was done in September, 1821. The patient got well. Roser (Arch. für Physiol. Heilkunde, 1859, p. 125) mentions a circular valvular stricture an inch from the anus, in a little girl of four, which he treated by division."—Van Buren: "Lectures upon Diseases of the Rectum and the Surgery of the Lower Bowel," New York : D. Appleton & Co., 1881, p. 263, note.

one and a half inches from the anus. There was marked bulging of the rectal pouch against the finger when the child cried, and at one point a small depression in the septum could be made out with the end of the finger. Although the finger could not be made to enter this orifice, pressure against it seemed to dilate it to an extent sufficient to cause the escape of a stream of fluid fæces several inches from the anus when the finger was removed. Operation was refused and the child passed out of sight.

5. *The Anus may be Absent, and the Rectum may Open by an Abnormal Anus at any Point in the Perineal or Sacral Region.* —When the rectum terminates in the glans penis, the labia, or at some abnormal point in the perineum, the lower portion of it

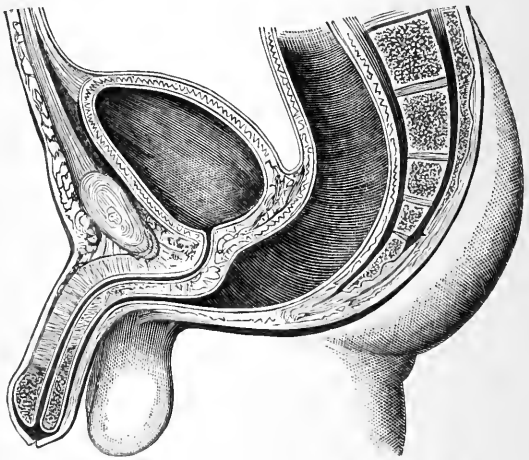

Fig. 40.—Rectum ending in Glans Penis. (Mollière.)

is usually of a fistulous character, as shown in the plate (Fig. 40), but lined by true mucous membrane; and the anus, whether in the perineum or at the base of the sacrum or tip of the coccyx, is always narrow and insufficient for its purpose. A modification of this class of abnormalities is found in those cases where the rectum terminates in two openings at a greater or less distance from each other.

Cruveilhier [1] reports a case of this nature, in which the fistulous prolongation of the rectum ran subcutaneously in the scrotal *raphé* and terminated at the glans penis.

Mr. Morgan [2] has recently reported two modifications of this

[1] "Anat. Pathologique du Corps Humain," t. i., liv. i., planche vi.

[2] "Three Cases of Unusual Deformity of the Anus," Lancet, October 22d, 1881.

species of deformity which are rarely met with and are easily relieved. In the first the anus was of the usual size and in the proper location; but there was found to be a band of tissue passing from a point corresponding to the apex of the coccyx to the median *raphé* of the scrotum, with the posterior extremity of which it was continuous. The band was about three-quarters of an inch long, and was attached at both ends, the remainder forming a thick, free cord, which lay below the aperture of the anus, while from the centre of this band there ran a small branch of similar tissue, which was attached to the skin of the left buttock and was about half an inch in length. The skin covering the central band exactly resembled that of the scrotum, shrinking and contracting upon stimulation, and it was so placed that any passage of fæces must cause it to be stretched, thus accounting for the pain attending each motion of the bowels.

The second case was similar. The child was born with an imperforate anus, but the membranous septum gave way spontaneously. The child, however, continued to suffer pain on defecation, and on examination there was seen a small, thick band passing from the median *raphé* of the perineum in front to the depression between the buttocks posteriorly, and broadest behind. At a spot corresponding to the anus, on either side of the band, was a depression: that on the right was patent and allowed a probe to pass into the anus; that on the left, though similar in appearance, proved to be only a *cul-de-sac*.

In a third case there was a depression at the usual site of the anus, and the parts around were so far natural that the skin was pigmented and puckered, but there was no communication with the rectum. The spot at which the fæces passed was in the median line half-way between this depression and the posterior commissure, but nearer the latter than the former. The opening was very small, and a probe passed up into it showed an abundance of tissue between the passage and the vagina. The cure consisted in enlarging this abnormal opening posteriorly into the depression representing the natural one. Delans[1] reports an analogous case in a well-nourished child aged four and a half years. There were two openings, one on each side of a median bridle, which was continuous with the *raphé* in front and behind, and was composed only of skin and mucous membrane. Each opening seemed to be the natural one, but the one

[1] Soc. de Chirurgie, March 24th, 1875.

on the left was a *cul-de-sac* fifteen millimetres deep. The septum was excised, with what result is not stated.

A case of peculiar interest is that of a man having reached the age of fifty-four years with an imperforate anus. Immediately after birth fæces and urine were passed by the urethra, the anus being imperforate. An attempt was made to establish an anus in the natural situation, but only a narrow and useless fistulous opening resulted and the passages continued as before, except that fluid from time to time escaped from the anus. At the age of ten years the urethra became blocked with hardened fæces, and relief was obtained by an incision into it immediately in front of the scrotum. The result was a permanent fistula, through which the patient continued to pass fæces and urine. He was in the habit of taking a laxative daily, and had to squeeze the fæces through the fistula with his fingers. From time to time the urethral fistula became blocked, and then everything was passed by the meatus. Sometimes, also, the urethra became blocked, and then the fæces escaped by the urethral fistula and the urine by the same opening and also by the anal orifice. The urine was generally normal, though it sometimes contained a brown deposit and had a fæcal smell. He had been married twenty-four years and was the father of one child. His complexion was dark—not unlike that of a patient with Addison's disease. Latterly the urethral fistula had contracted and his difficulty had increased. Three days before admission to hospital the urethra had become blocked and compelled him to seek assistance. On examination a fistulous opening was found in the urethra just in front of the scrotum, along which a probe passed readily into the bladder. The urethra between the fistula and meatus was blocked by a fæcal concretion. The anal opening only admitted a fine probe. The urethra was slit up through the fistula an inch and a half and the substance blocking the canal removed. The mucous membrane was then sutured to the skin and the fistula converted into a good-sized opening, through which he continued to pass both urine and fæces so comfortably that he refused further operation.

6. *The Anus may be Absent and the Rectum may end in the Bladder, Urethra, or Vagina.* (Fig. 41.)—Forty per cent of all cases are included in this class, and that in which the rectum opens into the vagina is the most common. In females the opening is seldom, if ever, into the bladder, but sometimes it is into the urethra. In males it is more often into the bladder

than into the urethra, and in such cases the rectum may terminate either by a narrow duct running obliquely through the bladder and opening in the *bas-fond* between the orifices of the ureters, or by a free opening. The symptoms of this condition will of course vary greatly according to the location of the abnormal opening. When the communication is between the rectum and bladder, the fact will be shown by the mixture of the meconium with the urine, rendering the latter thick and greenish in color. The amount of meconium present will also indicate whether the opening is large or small. This condition is generally fatal, from the development of cystitis and from intes-

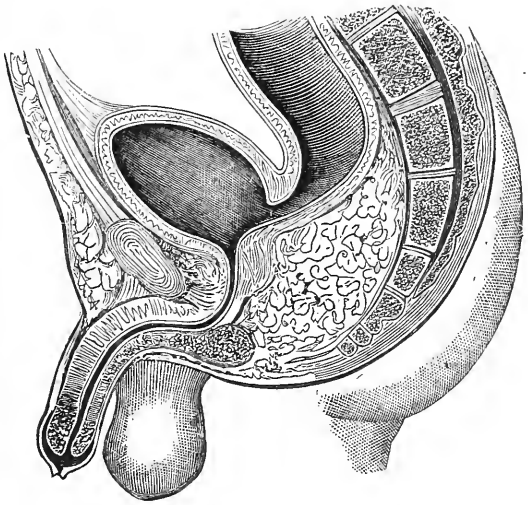

FIG. 41.—Rectum ending in Bladder. (Mollière.)

tinal obstruction, unless the condition be relieved by the appropriate surgical interference.[1]

When the communication is urethral in the male, the meconium will often escape independently of the act of urination; and although the first flow of urine may be mixed with meconium, the remainder will be clear. The prognosis is not as bad in these cases as in the vesical variety, several being recorded

[1] As showing what the bladder and urethra may bear, however, Rowan's case is of great interest. In it defecation took place through the penis for two months without causing any signs of irritation, though the child was several months old and the rectum was filled with well-formed hard fæces.—Australian Medical Journal, March, 1877.

in which life has been preserved for a number of years. Gross[1] relates one case in a man aged thirty, and Bodenhamer cites several others in which children have lived three or four years.

In the female the prognosis is more favorable than in the male, from the greater facility with which the meconium escapes.

Where the abnormal opening is between the vagina and rectum, and is of considerable size, as it generally is, the prognosis is not necessarily grave. Women have been known to live to a good old age, even to reach one hundred years in the case of Morgagni, with this malformation, and to perform all the duties of wives and mothers without even being conscious of anything abnormal (Fournier,[2] Ricord).

In absence of the rectum, if there exists a vesical communication the intestine is high up and colotomy is indicated; if, on the other hand, there exists a communication with the urethra, the intestine is low down and should be searched for in the perineum. When there is a communication between intestine and bladder, the possibility of a malformation of the ureters and of the genital tract must be borne in mind.

Ball has placed on record the following unique case of malformation which properly comes under the sixth variety—one of atresia ani, in which a diverticulum from the rectum passes forward and becomes related to the urethra without opening into it. The patient, a medical man, after suffering for some days from intermittent fever, developed an inflammatory swelling at the root of the penis and deep in the scrotum. He had suffered from some pain while the bowels were being moved. An incision into the swelling opened up a gangrenous and fœtid abscess apparently in connection with the left crus penis. Passing the finger into the rectum, a membranous stricture just within the rectum was found, through which the finger readily passed, and above which could be detected a diverticulum of the rectum passing in the direction of the abscess. The anus and stricture were forcibly dilated. Subsequently fæcal matter in small quantity passed from the wound at the root of the penis. The patient had been born imperforate and operated upon. He subsequently recovered, and the diverticulum seems to have closed by inflammatory action.

7. *The Rectum and Anus are Normal, but the Ureters, Uterus, or Vagina Empty into the Rectal Cavity and Discharge their Contents through it.*—This species of malformation is rare, and

[1] "A System of Surgery," H. C. Lea, Philadelphia, 1872, vol. ii., p. 657.

[2] "Dict. des Sci. Méd.," t. iv., p. 155.

is usually attended by other signs of imperfect development. It is not incompatible with life or with conception.

8. *Total Absence of the Rectum.*—This variety differs only from the third in the amount of the rectum which may be absent. It may or may not be attended by an absence of the anus, but is usually only one of the signs of arrested development. The blind pouch of the rectum may hang loose in the abdomen or pelvis; may be attached at the base of the sacrum or to some of the adjacent parts; or may be continued down as a fibrous cord to the site of the anus.

9. *Absence of the Large Intestine.*—This is also attended by an absence of the normal anus, the place of which is supplied by an abnormal opening in the umbilicus, or at some remote part of the body, as, for example, the side of the chest, or the face. With this abnormal opening the small intestine or what remains of the colon communicates.

Thus far only arrests or excesses of development have been mentioned. The rectum and anus are, however, liable to certain diseases during fœtal life which may result in narrowing or completely obliterating their calibre. Among these are enteritis and proctitis.

The longest possible period of life in a child with absolutely impervious rectum has not yet been determined. In a case reported by Cripps[1] the diagnosis was made on the third day, but treatment was not permitted, and the child was brought back thirty days later, still to all appearances quite well, but with distended abdomen and fæcal vomiting. How much longer she might have lived had not operative measures been immediately fatal cannot be judged. Another case has recently been recorded in which the trocar was used on the twenty-seventh day, giving temporary relief,[2] and other literature of even longer periods is given in the note.

Note.—De la Marc: "Observation sur l'anus imperforé d'un enfant de six mois," Jour. de Méd.-Chir., etc., Paris, 1770, vol. xxxiii., p. 510.

Cleveland: Case of imperforate anus; child lived upward of ten weeks without relief from the bowel after two unsuccessful operations. "Trans. of the Obstet. Soc. of London," 1867, vol. ix., p. 203.

Prichard: Imperforate anus; life prolonged to the one hundred and second day without evacuation. Prov. Med. and Surg. Jour., London, 1851, p. 123.

A curious case is recorded by Mercier of a girl thirteen years old with imperforate rectum, who vomited fæces every fourth or fifth day and seemed to be doing well; but it may not be entirely reliable.

[1] "Diseases of the Rectum and Anus."

[2] Coskery: N. Y. Med. Jour., July 3d, 1886.

The prognosis depends in great measure upon the form of the anomaly. In the varieties first described, in which the condition is easily remedied, it is exceedingly good. It is also good in cases where the rectum communicates with the vagina. In all the others it is bad, and too much must not be expected from the line of treatment about to be described. An opening may be made either in perineum or groin, life may be prolonged, immediate relief may be given, and occasionally adult age may be reached in comfort; but the operations themselves are severe and sometimes fatal, and when immediately successful the children do not seem to thrive. Cripps has tabulated one hundred of these cases of all varieties, and his table is very instructive. It is as follows:

16 cases	colon opened in groin,	11 died.
3 "	" " " loin,	2 "
17 "	puncture,	14 "
8 "	coccyx resected,	5 "
39 "	perineal dissection or incision,	14 "
14 "	communication with vagina,	1 "
3 "	miscellaneous,	3 "
100 cases.		50 died.

Of the fifty deaths, fourteen were from peritonitis, ten from failure to give relief, and nineteen more probably from the same causes, though the cause is not recorded. In spite of this unfavorable showing, the surgeon must do what he can. There is always the hope that the rectum may be reached from the perineum; and even if this fail, a child with an artificial anus in the groin may be very comfortable.

Treatment.—The treatment of the class of congenital contractions of the anus and rectum, and of the class of membranous septa, has already been referred to and is exceedingly simple and generally attended by good results. The treatment of the remaining varieties, except the eighth and ninth, which do not admit of surgical interference, may be guided by the following general propositions:

1. *An Operation should always be Performed without Delay.*—There is nothing to be gained by waiting for the rectal pouch to become distended with meconium, and there is much to be lost. If the obstruction be complete, death is a necessary result, being produced, generally within the first week, by peritonitis, rupture of the over-distended bowel, or by a gradual wasting without acute symptoms. Even in cases where a certain amount of meconium makes its escape by a narrow orifice,

and delay is not, therefore, as necessarily dangerous as in cases of complete obstruction, nothing is to be gained by delay, and an immediate operation may avoid a paralysis of the bowel from over-distention.

The only exceptions to the rule of early operation are those in which there is a free communication between rectum and vagina. The patient is in no danger, and the operation can be performed better as the parts become better developed. And, again, in cases of communication between the rectum and urinary tract the demand for operation is not immediate, and time may be taken to watch the case and determine whether the opening be vesical or urethral. In fact, several weeks often elapse before such a child is seen at all by the surgeon.

2. *If there be any Chance of establishing an Opening at the Normal Site of the Anus, the Surgeon should at first direct his Attention to this Procedure.*—And since in most cases it is impossible to tell that the rectal pouch may not be within easy reach from the perineum, it is generally good surgery to make a tentative incision at this point.

Before attempting any operation on a child's pelvis, the surgeon should remember the exceeding smallness of the space in which he is obliged to work, even in its natural state; and also that the normal measurements may be decreased in any case of congenital malformation. These normal measurements, according to Bodenhamer, who made them on two new-born, well-developed male infants at full term, are as follows:

First case: From one tuberosity of the ischium to the other, one inch and one line. From the os coccygis to the symphysis pubis, one inch and three lines. From the os coccygis to the promontory of the sacrum, one inch and two lines.

Second case: From one tuberosity of the ischium to the other, one inch. From the os coccygis to the symphysis pubis, one inch and one and a half lines. From the os coccygis to the promontory of the sacrum, one inch and one line.

The means at the disposal of the operator for reaching the rectal pouch through the perineum and establishing a new outlet consists in puncture, incision (proctotomy), and in the formation of a new anus by a plastic operation (proctoplasty). The operation by puncture consists in plunging a trocar through the perineum in the supposed direction of the rectum, for the purpose of establishing an outlet. It may be done without a preliminary incision, or after a careful dissection which has failed to reach the desired point.

3. *The Use of a Trocar as an Aid in finding the Rectal Pouch before or after Incisions through the Perineum is not sanctioned by Modern Surgical Authority.*—We have already referred to Cripps's case of imperforate rectum. In this a trocar was used; and though the rectal pouch was within reach of the perineum, the instrument passed between it and the uterus and punctured the peritoneum. Such may be the case at any time; and this unsurgical procedure has been followed by numerous accidents, as, from its nature, it must. In the faint hope of finding one thing which he does not know to be there, the surgeon takes the risk of wounding two things which are there—the peritoneum and the bladder—and a wound of either of these may be fatal.

Another and almost equally strong objection to this procedure is the fact that it is utterly useless even when successful. It allows of an immediate escape of the contents of the bowel, but that is all. No such opening can be made to do duty permanently as an anus by any amount of care or subsequent dilatation.

The peculiar mortality attending the use of the trocar is shown by the fact of fourteen deaths in seventeen punctures, mostly from peritonitis. The conformation is often such that it is impossible to avoid peritoneum even when a successful puncture is made and meconium is evacuated; for the peritoneal sac may extend down on the lower end of the *cul-de-sac* so as nearly to cover it, then be reflected on to the bladder in the usual way. In such a case, if a puncture be made from below, the trocar will enter and leave the peritoneal cavity before reaching the rectal pouch, and when this is reached it is simply allowed to drain into the peritoneal cavity after removal of the instrument.

4. *The Results of Attempts to establish an Outlet for an Imperfect Rectum by means of Incisions alone through the Perineum are not favorable as regards the production of a Useful Anus.*—The operation consists in cutting through the perineal tissues, stroke by stroke, until the rectal pouch is reached and opened. The incision should be longitudinal and should reach from the scrotum to the tip of the coccyx. Should the fibres of the external sphincter be encountered beneath the skin, they may be carefully separated as near the median line as possible and drawn to each side. The direction of the dissection, which it is needless to say should be made with the utmost care, should be backward toward the concavity of the sacrum in the line which the rectum normally follows. Additional safety may be secured by the introduction of a sound into the male

bladder or the female vagina. The finger is to be frequently used as a director in exploring for the rectal pouch, while the hand of an assistant makes pressure on the abdomen. In this way the dissection may be carried to the depth of an inch or possibly an inch and a half, but at this point, if unsuccessful, it should be abandoned for fear of wounding the peritoneum.

This operation, though it may be successful in allowing the escape of meconium and in prolonging life, does not, in most cases, result in a useful anus for any great number of years. This is the experience of the greater number of writers upon this subject. Van Buren[1] says: "I have in several instances succeeded, by careful dissection, in reaching a fluctuating point of a blind rectal pouch, and in establishing a free outlet for the meconium, but in no case has it proved permanently useful. It has always been necessary to employ bougies or tents more or less constantly to keep the new canal from contracting, and the care, and pain, and trouble of fighting against the closing stricture, and the persistent tendency to obstruction and fæcal accumulation, have invariably led to early death. At present I know of no such case treated in this way in which a permanently satisfactory result has been attained." Amussat,[2] Sir Benjamin Brodie, Velpeau,[3] Benjamin Bell,[4] and many others, have borne testimony to the same effect. On the other hand, cases are occasionally seen where the result is more favorable, but they constitute a small minority of the whole. What the operation really accomplishes is the formation of a fæcal fistula, with all the discomforts attendant upon such a condition.

It was this difficulty, combined with the loss of two cases in which the operation had been performed, from blood poisoning with jaundice which Amussat considered to be due to the absorption of meconium and fæcal matter by the freshly cut surface, which led him to abandon this operation and to substitute in its place the one now to be described.

Proctoplasty.—This operation is the same as the last, with the addition of two important features. In the first place, the rectum is drawn down and stitched to the skin; and, second, to facilitate this, when necessary, either the new anus is made just at the tip of the coccyx, or that bone is exsected and the anus

[1] Op. cit., p. 371.

[2] "Observation sur une Opération d'Anus artificiel," etc., Gaz. Méd. de Paris, November 28th, 1835, p. 753.

[3] "Nouveaux Eléments de Méd. Opératoire," Paris, 1832.

[4] "A System of Surgery," vol. ii., chapter xix., Edinburgh, 1778.

made in the place it occupied. Where much of the lower end of the rectum is deficient, it may not be possible to draw the *cul-de-sac* down to the skin without more traction and dissection than it is safe to employ. In such cases the excision of the coccyx, as originally recommended and practised by Amussat,[1] and more recently by Verneuil,[2] besides adding to the chances of finding the rectal pouch, diminishes the distance over which the rectum must be stretched. Unfortunately, in the cases where the operation is most needed—those in which the rectal pouch is furthest from the skin—the operation is not always practicable; and in other cases the adhesions of the rectum to the bladder or vagina may be an insuperable obstacle.

The treatment of the class of cases in which the rectum opens into the vagina offers a fair chance of success. If the opening be sufficiently large to permit of free evacuation, there need be no hurry to operate before the age of puberty. At this time the conformation of the parts will have changed, there will be more room in which to work, and a better result may be obtained. Also there sometimes develops such an amount of sphincteric power in the vagina, and so little inconvenience is caused by the condition, that the surgeon should seriously consider the propriety of any interference whatever. Cases are on record in which this malformation has existed in wives and mothers without their ever having suspected that they were different from other women. On the other hand, if the opening be merely fistulous in character and only large enough to permit of dribbling of meconium, the condition will grow more serious as life advances; and as the character of the fæces changes from fluid to solid more or less obstruction begins to be manifest, the colon becomes distended with solid matter, and the condition will end fatally unless relieved.

The treatment of these cases is comparatively easy, because a bent probe passed through the vaginal opening and turned toward the perineum marks the end of the rectum and can be cut down upon through the skin. After this has been done the rectum should be carefully dissected from the vagina and drawn down to the surface, if possible. This is known as Rizzoli's operation, and is performed as follows:

With the patient in the lithotomy position, a sharply curved

[1] "Troisième Mémoire sur la Possibilité d'établir une ouverture artificielle sur la colon lombaire gauche sans ouvrir la Péritoine, chez les enfans imperforés," Paris, 1842.

[2] Gaz. des Hôp. de Paris, July 29th, August 5th, 1873, pp. 604, 715.

vesical sound is passed into the rectum through the vaginal orifice. An incision is made in the median line reaching from the margin of the anal orifice in the vagina to the tip of the coccyx, and carried deeply enough to reach the surface of the rectum, but not deeply enough to open it. The dissection of the rectum requires caution ; and when it has been exposed as far as possible by this median incision, the knife is to be carried round the vaginal anus, and the remaining part of the rectum separated from its connections until the anus can be placed without much traction in the posterior angle of the wound as near as possible

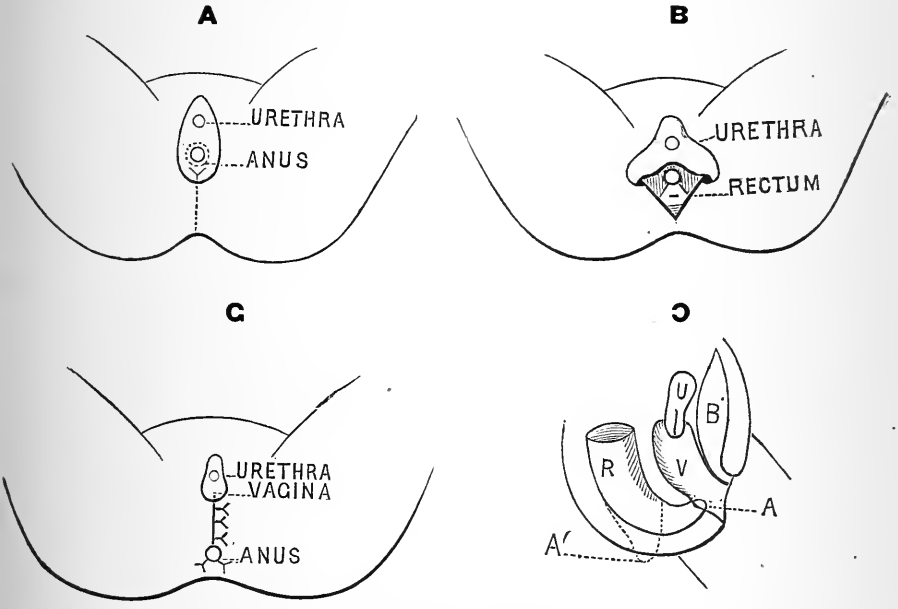

FIG. 42.—Rizzoli's Operation.

A shows the relative position of the parts and the line of incision (dotted).
B shows the parts separated and the anus dissected out.
C the operation completed.
D a diagrammatic vertical section to show that when the end of the rectum is dissected out and turned back there is no tension at the extremity. B, Bladder; U, Uterus; V, Vagina; A, Anus; R, Rectum.

to the coccyx. The separation of the rectum anteriorly should be freely done, and after the separation of the anus it is not difficult. The margin of the anus is next stitched to the posterior angle of the wound, next the sides of the vagina are united, and lastly the perineum. This order of procedure is of great importance when working in so small a space. The operation should be done antiseptically, and care should be used that no blood between the cut surfaces be allowed to interfere with pri-

mary union. Usually the fæces pass readily and no dilatation of the orifice is required; but should this be thought too small, it may be enlarged by a posterior median incision. It is essential that the anus should be fixed as far back as possible, as the tendency of cicatrization is to draw it forward, and after the effects of the operation have passed it will be found nearer the vagina than expected.

In case of Failure to Establish a New Anus in the Anal Region, Colotomy should at once be Performed.—The teachings of different authorities will vary as to the propriety of first performing the perineal operation before resorting to colotomy, according to the views of each one upon the question of the desirability of colotomy. Some follow the rule I have laid down, that it is always better to attempt the perineal operation where there is a chance of its succeeding; others limit the latter operation to cases where the rectal pouch is known to be near the skin, and in all others turn their efforts at once toward the colon. The abdominal operation is obviously the only one where the rectum ends high up in the pelvis, and it is generally to be preferred in that class of cases where it opens into the bladder or urethra.

Rectal Diverticula.—In connection with this subject of congenital malformations it may be of interest to know that a few cases of true diverticulum of all the coats of the rectum, similar to Meckel's diverticulum from the ileum, have been observed. Ball[1] gives one in full from Hulke, and Maas, of Würzburg, has recently reported the following: The patient was a boy, aged fourteen. Shortly after birth the abdomen began to swell, and increased in size as years passed by, without affecting the general health, till the age of thirteen. At this time the swelling became much larger and caused dyspnœa and palpitation. Congenital hydronephrosis on the left side, or cystic degeneration, was diagnosticated. An exploratory incision was made, but the idea of an operation was abandoned and the boy died suddenly. The tumor proved to be an immense diverticulum from the upper part of the rectum, filled with fourteen litres of thin fæces and containing gas. The opening of communication was at the posterior and inferior aspect of the pouch. The rectum was strongly compressed by the tumor.

[1] Page 397.

CHAPTER IV.

PROCTITIS AND PERIPROCTITIS.

Inflammation of the rectum may be traumatic, catarrhal, dysenteric, diphtheritic, or gonorrhœal.

Traumatic proctitis may arise from a multitude of causes. Foreign bodies which have passed along the rest of the canal may become lodged in the rectum, and foreign bodies may be introduced into the anus and cause direct injury to the rectum. It may be due to the frequent and improper use of the syringe either by the patient or a heavy-handed nurse. I have during the last few years seen several severe cases in patients who were treating themselves by the use of the patented syringe with a bent nozzle which is sold by one of the American quacks for washing out the rectum night and morning. The nozzle is long, and a rubber umbrella ring is fitted around it so that it can always be introduced to just the proper distance to reach the hypothetical ulcer which is to be washed out, and no further. The practical result is that the end of the tube always touches about the same point of mucous membrane, and a stream of fluid is thrown with considerable force against this point twice a day, until after a few weeks a decided injury is done and the diagnosis of ulceration at last becomes true.

Catarrhal proctitis may be acute or chronic. The acute form is often due to direct irritation, perhaps more often from the presence of hardened masses of fæces in the rectal pouch than from any other cause. Ball thinks in some cases this may be due to chemical action the result of putrefactive changes. Of this I have no proof, but the direct mechanical irritation and subsequent ulceration caused in this way I have become familiar with from clinical observation.

In children the presence of pin-worms will cause sufficient irritation to produce the same condition. Other causes are the abuse of drastic purgatives, such as aloes, gamboge, or even rhubarb in excess; the prolonged sitting on a cold or wet seat; and the existence of some other disease in or near the rectum

acting as an irritant, such as a neoplasm, an intussusception, or an abscess around the rectum.

By far the worst case of chronic catarrhal inflammation of the rectum I have ever seen was due to a small, benign polypoid growth situated about four inches from the anus. It had existed at least ten years and had caused the usual amount of irritation. The patient had all this time been treated for ulceration of the rectum; acid had been frequently applied, the strongest astringents had been used, the "ulcer" had been cut and scraped; and when I finally removed the polypus the mucous membrane, from anus to sigmoid flexure, was soft, thickened, boggy, granular, and bleeding freely. With all this there was no actual ulceration and no loss of substance, the most marked symptom being the profuse hæmorrhage.

In almost all cases of prolapsus of any duration there will be found a certain amount of acute or chronic catarrhal proctitis complicating the original trouble and disappearing spontaneously with its removal; and the same is true of many cases of internal hæmorrhoids. The mucous membrane covering the tumors at first becomes inflamed, generally from direct injury, and the inflammation thus commenced is continued up the rectum till the symptoms of proctitis or ulceration are superadded to those of the original trouble.

A large class of cases of catarrhal proctitis is found among women with uterine misplacements. Any disease of the uterus which causes undue pressure upon a certain spot in the rectal wall will set up an inflammation of the mucous membrane at that point, the symptoms of which may mask the primary disease. Many cases of women suffering from rectal symptoms, with pains in the back, loins, and thighs, and the passage of bloody and mucous stools, will be found to come under this category.

Another cause of catarrhal proctitis, according to Esmarch and Bushe, is gout, alternating with the manifestations of the disease at its usual localities.

Dysenteric proctitis is not uncommon in the southern portions of the United States, and is by no means unknown in certain regions of the North. The acute cases are much more apt to come under the observation of the physician than the surgeon, but the chronic ulcerations and strictures are often brought to the rectal specialist for diagnosis and treatment. More will be said upon this class of cases under the chapters on Ulcerations and Stricture.

Diphtheritic proctitis is a local manifestation of the general poisoning exactly analogous to the inflammation of the air passages, and attended by the same production of membrane, in males in the rectum, in females generally also in the vagina. As Ball points out, it is an indication of the profound effect which the specific poison has had upon the system.

Gonorrhœal proctitis in men is generally due to the habit of passive pæderasty resulting in direct contagion. In women it may be due either to this cause or to the inoculation of fissures or erosions of the anal mucous membrane by a gonorrhœal discharge from the vagina flowing over the anus. The disease is rare and will be further described under Venereal Affections.

In the acute variety of catarrhal proctitis the inflammation does not extend deeper than the mucous membrane, which is congested and hyperæmic. In the chronic the inflammation involves the submucous and muscular layers. The acute generally ends in resolution in from eight to fourteen days where the cause can be found and removed. It may, however, in severe cases go on to actual gangrene and terminate fatally. The chronic results in infiltration and consequent thickening of the rectal wall, and may end in ulceration, either superficial and confined to the epithelial layer of the mucous membrane, or deep and involving the whole thickness of the mucous layer. What is described as follicular ulceration (ulceration affecting the mouths of the tubular follicles) may result from chronic inflammation, and these ulcers, which are very minute at first, may coalesce and gain in depth till they cause perforation of the bowel. When the perforation is above the peritoneal reflection a fatal peritonitis may result; when lower down, an abscess or fistula (see Fistula). A chronic proctitis may in this way be a cause of stricture, and may result in the hypertrophy known as chronic parenchymatous proctitis.

The symptoms of this affection have been partially detailed in the cases which have been related. They are, in the acute form, a sensation of heat and weight in the part which may amount to actual pain, and may involve the bladder, uterus, and sacral region, and radiate into the loins and down the thighs. The anus also becomes painful, red, and contracted, and in children the mucous membrane may become slightly everted from the swelling and tenesmus. The evacuations soon become painful and increased in number, and the fæces are streaked with mucus, blood, and pus. There is apt to be also a train of symp-

toms referable to the bladder and to the generative organs, such as painful micturition, cystitis, and leucorrhœa.

With these local symptoms there may be more or less constitutional disturbance, fever, and loss of appetite. As the discharge from the inflamed surface increases in amount, the desire to empty the rectum produces more frequent evacuations, so that while at first the fæces are only stained with pus and blood, later the evacuations consist entirely of the muco-purulent matter, and the anus may become excoriated by the discharge.

In the chronic form the symptoms are all less marked. The diarrhœa may alternate with constipation, and the discharge will occur only at the time of defecation. This condition may last for years. An examination of the rectum during the acute stage of proctitis will generally cause considerable pain. The rectal mucous membrane will be found intensely congested, and the temperature, as shown by the thermometer or even by the finger, will be increased. In the chronic stage the solitary glands may occasionally be recognized as small round prominences in the substance of the mucous membrane.

Proctitis is generally found associated with stricture of the rectum and is secondary to it. In these cases the mucous membrane below the stricture will be found congested and covered with pus or bloody mucus, while above it is eroded and destroyed, sometimes only superficially, at others for its entire depth. In such cases the other layers will be found hypertrophied, especially the circular muscular layer.

The treatment of proctitis consists first of all in an endeavor to discover and remove the cause of the congestion, be it what it may. If hæmorrhoids are at the bottom of the trouble they must be removed, and the same with polypus. In the cases associated with uterine disease it may be necessary to first turn the attention to this organ and rectify a displacement or operate upon a lacerated cervix.

In treating the proctitis itself both local and general measures may be adopted. Absolute rest in bed, with a diet of milk, meat, and eggs, which leaves the least possible amount of fæcal residue, should be strictly enforced. The bowels should be moved by saline cathartics in small doses to produce semi-solid stools, or by the compound licorice powder, or castor oil if the patient does not object to the dose. In the acute stage the pain and tenesmus may best be treated by injections of starch water, bismuth, and opium, given in doses small enough to be retained.

The use of the speculum or suppositories should be avoided on account of the pain caused by their introduction.

In the chronic stage astringents are necessary, and sulphate of zinc, tannin, and nitrate of silver may each be tried. If the spot of diseased mucous membrane can be reached through a speculum, it may be painted with a five- or ten-grain solution of nitrate of silver and a brush. If the disease covers more surface, an injection of a solution of nitrate of silver (2 grs.–℥ i.) will more likely come in contact with the whole affected part, and this should be followed immediately by a more copious enema of warm water. Such an application should not be made oftener than every second or third day. For the treatment of the ulceration resulting from this disease the reader is referred to the chapter on Ulceration.

Periproctitis occurs in several distinct varieties, the most serious of which is of septic origin, is diffuse and not circumscribed, and is the chief cause of death after capital surgical operations upon the rectum. In my own practice I have fortunately met it but twice, though I have seen it follow the division of a small fistula in hospital and end fatally.

In my first case the inflammation was started by the injection of a strong solution of carbolic acid into a small internal hæmorrhoid in my office. Whether the injection perforated the rectal wall and landed in the surrounding cellular tissue or not I cannot say, nor is it important; but forty-eight hours afterward I found the patient in bed, with high temperature following a chill, and a large, brawny induration over the corresponding buttock. There were enlarged and painful glands in both groins, and the swollen and painful lymphatics around the rectum could easily be made out by digital examination. Free incision in the perineum and irrigations of bichloride 1:2000 saved the patient's life; and weeks later, the abscess having meanwhile communicated with the rectum high up, an operation for fistula cured him, but he was in bed several months.

My second case was not so fortunate. The patient was a young man with tubercular ulceration of the rectum and in the general state of health which accompanies that condition. The ulcer was scraped with the sharp spoon and lightly cauterized with the thermo-cautery. This had such a good effect that after several weeks it was repeated. After about forty-eight hours there was a severe chill and the temperature rose to 105.5°. The inflammation in this case was so deep that for the first two or three days I could not find it; but it finally appeared as an erysi-

pelatous blush, with brawny, œdematous skin and connective tissue, in the right iliac fossa, having evidently worked to the surface in this way from the deep parts of the pelvis. The cutaneous swelling extended day by day till it covered the entire right side of the abdomen and nearly reached the axilla; but there was never any attempt at self-limitation, and at no time any chance to use the knife. Just before death a corresponding spot appeared near the anus on the opposite side of the rectum—a spot as large as the palm. The patient died of exhaustion and pulmonary œdema about a week after the initial chill.

This is the complication which, in spite of antisepsis, causes the high death rate in extirpations of the rectum. It is of septic origin, analogous to puerperal septicæmia, and shows itself in the two forms so well marked in the two cases I have recorded. In its general symptoms it follows closely the clinical history of pyæmia.

In the way of prophylaxis much may be done by antisepsis and drainage during and after all operations on the rectum. There is no operation on the rectum too trivial to be done with care and cleanliness; and yet the capital operations which are now matters of daily occurrence show what results may be obtained by proper attention to these details. This is not the place to go into the details of each surgical operation, but I have learned the greatest single element in prophylaxis to be the avoidance of all pockets and wounds without free outlet around the rectum. A cut should never be made through the rectal wall into the cellular tissue without in some way allowing for the free escape of all the discharge from such a cut.

In the way of treatment for periproctitis, life may be saved by free incisions and antiseptic irrigations where the inflammation shows any tendency to become circumscribed; but otherwise the disease is fatal.

Gangrenous Cellulitis.—There is a form of gangrenous cellulitis which sometimes affects the ischio-rectal region. It is a rare disease and is generally idiopathic. In it there is no pus formed, but the cellular tissue and the skin over it become necrosed and slough in large, black masses. The adjacent portion of the rectal wall may be involved and the rectum be laid open for a considerable extent. The disease is attended with fever and great prostration; the tendency to relapse and extension is marked, and the cavity left after separation of the slough

closes very slowly. Jordan,[1] who has given a short clinical report of a few cases, has always seen it in large, heavy men who eat too much and drink heavily. In such, a very slight irritation, such as is caused by sitting on a wet seat, is sufficient to start the trouble. These cases not infrequently end fatally from extension of the gangrene into the pelvis or exhaustion. The treatment consists in early and free incisions and in supporting the powers of the patient.

The other forms of periproctitis—those which are not septic and are distinctly circumscribed—will be treated of under the head of Abscess.

[1] "A Clinical Lecture on Idiopathic Gangrenous Cellulitis around the Rectum." Furneaux Jordan, Brit. Med. Jour., January 18th, 1879. Also, Jackson, Brit. Med. Jour., February 8th, 1879. This disease is apparently the same as that defined by Dunglison under the head of Proctocace (Proctitis Gangræenosa, Mastdarmfäule, Cacoproctia) and so named by Fuchs. "According to him it is common in Peru, in the neighborhood of Quito and Lima, on the Honduras and Mosquito coasts, in Brazil, and on the Gold coast. It is called by the Portuguese Bicho and Bicho di Culo; by the people of Quito, Mal del Valle, from its prevalence in the valleys; and in Africa, Bitios de Kis. It is an adynamic, inflammatory condition, frequently ending in gangrene. It has been attributed to bad food and the use of spices."—Dunglison.

CHAPTER V.

ABSCESS.

Abscesses in the region of the anus and rectum are best classified according to their anatomical location into superficial, ischio-rectal, and pelvic. Of each of these there are several different varieties.

Considering first the superficial variety; the simplest form will be found to be that which involves the skin of the margin of the anus alone, and which generally originates in one of the minute glands of the part. Such an abscess may be due to traumatism, or to any irritation—such as the use of improper paper after defecation, prolonged walking or horseback riding, a menstrual discharge, or a discharge due to diarrhœa or dysentery—to suppuration beneath an inflamed pile, or to the presence of a caseating tubercular nodule. I have several times seen it follow injections of carbolic acid into hæmorrhoids, the pus forming beneath the mucous and muscular layers and burrowing downward to the anus till it lay superficially over the sphincter.

This form of disease is always distinctly circumscribed, is generally about the size of an almond, is found by preference in robust persons, more often in men than women, seldom in old people, and almost never in children. It generally goes on rapidly to suppuration, breaks spontaneously on the cutaneous or mucous surface, and heals without the formation of fistula; though in cachectic or phthisical patients it may pursue a contrary course, the skin over it becoming thin and violet colored, and finally rupturing, leaving a permanent subcutaneous fistula, which by subsequent burrowing may reach a considerable size. Such is apt to be the course in the cases arising from the injection of carbolic acid.

The treatment of such an abscess consists chiefly in the attempt to avoid the formation of a fistula, and the best means for accomplishing this end is an early incision as soon as suppuration appears inevitable. Resolution is hardly to be expected,

but it may be sought for by the use of laxatives, rest in the horizontal posture, and the application of a bladder of ice. The incision should be large enough to allow of the free exit of pus, and after it has been made the part may be poulticed for a day or two, and the abscess cavity then dressed with lint, care being taken to keep the lips of the incision separated.

Another frequent cause of superficial abscess is the acute inflammation and suppuration of an external hæmorrhoid, which generally comes on after an attack of constipation and straining at stool, or may be due to the same causes as the last. The suffering caused by such a condition, as by the one last described, is out of all proportion to its apparent importance, and is sufficient to incapacitate a person of sensitive organization from all accustomed duties. The remains of former external hæmorrhoids are always liable to this accident, and by the proper abortive treatment the inflammation may sometimes be overcome without suppuration. If, however, suppuration appears to be inevitable, a small, sharp-pointed bistoury should be quickly passed through the little tumor.

There is also a form of superficial abscess which lies nearer to the mucous membrane than the skin, and is due to the acute inflammation of an internal hæmorrhoid, either just at the verge of the anus or within the sphincter. This is in reality a circumscribed phlebitis in a venous pouch which is shut off from the general circulation. A circumscribed, tense, exquisitely painful tumor is formed, varying in size from a grape to an almond, which, after a few days of suffering, ruptures spontaneously and allows the escape of a small quantity of pus. Such an abscess, when within the bowel, is always liable, as will be shown later, to result in the formation of a blind internal fistula or of a chronic ulcer if left to its own course, and should, therefore, be treated by early incision.

There is still another variety of superficial abscess, more serious in its consequences than those already described, for the reason that it affects the subcutaneous tissue and not the skin, and is diffuse and not circumscribed. The causes of this variety of abscess are the same as of those already mentioned, though traumatism plays, perhaps, a more prominent rôle. Falls, kicks, horseback exercise, and violence in the use of the syringe are its most frequent antecedents. Surgical interference with the rectum, as in the removal of a hæmorrhoid, may also be followed by this form of abscess, and it may arise from the perforation of the wall of the bowel just above the sphincter by

an ulceration of any kind, generally, however, that due to a foreign body. It has also been known to follow the suppuration of an internal hæmorrhoid.

The symptoms of this form of disease vary greatly in different cases. In cachectic persons pus may form in large quantity and break into the bowel, and a blind internal fistula may result. The diagnosis is generally easy. There will be the usual pain, tenderness, and swelling; and if the pain be not too severe to admit of the attempt, fluctuation may be obtained by introducing one finger into the rectum and making counter-pressure with the other hand outside.

There is little use in hoping for resolution in an abscess of this kind, and all active attempts to cause it will be found to do harm rather than good. The proper treatment is an early free incision. If the incision be made early, it may in itself have an abortive action, and under such circumstances it need not be very large. If pus has already formed or the skin has begun to grow thin over the abscess cavity, the incision should be free enough to allow of the easy escape of the contents, for in this way only can the formation of a fistula be avoided. In such a case drainage should be resorted to after the incision, and every effort should be made to secure healing from the bottom of the cavity.

When the incision is made in the early stage of such a tumor as this, while the skin is yet hard and infiltrated, a free hæmorrhage from cutaneous vessels is not uncommon, nor, on account of its antiphlogistic action, is it to be deprecated. Only when it has passed the bounds of safety need any steps be taken to arrest it, and this may always be done by a careful stuffing of the incision with picked lint. A word of caution against opening such abscesses as these in the surgeon's office, and allowing the patient to walk home, may not be out of place; for a small artery may commence spurting at any moment during the active exercise.

Ischio-rectal Abscess.—An abscess of the ischio-rectal fossa is generally bounded by the levator ani muscle superiorly, and by the skin below, with the rectum on one side and the adjacent portion of the pelvis on the other.

The causes of ischio-rectal abscess are various. Traumatism in some form accounts for many, and the injury may be either from within or without. Kicks, falls, wounds by the point of a syringe, perforation of the bowel by pins and fish bones, operations for hæmorrhoids, and injections of carbolic acid into the

rectal wall have all been followed by this complication. They may also result from rupture, ulceration, or perforation of the rectal wall in connection with stricture.

Again, these abscesses may be due to a submucous inflammation and production of pus, which first breaks into the rectum and forms an internal fistula, and subsequently extends outward, forming a large abscess; or they may be due to an acute phlebitis, or to faulty nutrition and a generally vitiated state. Finally, they may be in their origin entirely disconnected with the rectum, and due to disease of some neighboring part, or to necrosis of some adjacent bone of the pelvis or spine. In the latter case they are generally of the variety known as cold abscess, and are apt to be preceded for a long time by pain at the point of disease in the bone. These may best be diagnosticated by microscopic examination of the pus discharged and a search for bone débris.

An abscess of the ischio-rectal fossa shows itself with all the usual symptoms of acute inflammation and can hardly be mistaken for anything else. It may begin with chill and considerable constitutional disturbance, there will be severe pain, and the skin will be hard, red, and œdematous sometimes over a considerable part of the buttock. The pus, if allowed to take its own course (which it never should be), generally finds its way both to the cutaneous and mucous surfaces, and a complete and deep fistula results. It may, however, tend upward in the perineum, being less confined in that direction, and the prostate and urethra may be pressed upon, causing retention of urine.

The prognosis of ischio-rectal abscess depends almost absolutely upon the treatment adopted. If it be poulticed and allowed to take its own course, a fistula of greater or less extent is the certain result.

There is but one proper treatment for this form of trouble, and that is an early and free use of the knife. It may be considered a rule that an acute inflammation in this region will go on to suppuration, and hence that antiphlogistic measures adopted with a view of securing resolution are useless. As soon as the hard, brawny swelling appears, therefore, and without waiting for the pointing of pus, it should be freely and deeply incised. Ether will be necessary to perform this operation properly. A long, fine, straight bistoury should be inserted into the centre of the swelling and pushed forward till pus issues by the side of the blade. It may be necessary to carry the point fully four inches upward and to repeat the puncture more than once before

pus is found. Then turn the knife and make an incision from two to three inches in length through skin and cellular tissue. Into this the index finger should be passed, all sloughing tissue broken down, and all pockets opened up till it is certain that a free communication of all parts of the abscess with the external wound has been established. Then wash out the abscess cavity with a solution of bichloride 1:2000 till no more pus or débris can be seen in the returning injection. If the cavity be deep a drainage tube should be inserted and the wound dressed antiseptically. The bowels should be confined and the patient kept in bed for twenty-four hours, when the dressing should be changed and the cavity again thoroughly washed out with bichloride. After a few days of antiseptic dressing the surgeon can judge whether the cavity is closing promptly or whether the case is to be a long one, only healing by a slow process of granulation. In the former condition the impervious dressings may be continued till healing is complete; in the latter they may as well be abandoned and the cavity left to its own course, care being taken to prevent burrowing by drainage and free escape of pus. Though by this line of treatment I have frequently avoided the formation of fistula, I have not had much success in securing rapid closure of the abscess cavity, and healing has usually required many weeks.

These abscesses should not at first be laid open into the rectum, no matter how near they may have come to the rectal surface—a point which is generally misunderstood in practice because of the confounding of an abscess which may ultimately result in a fistula with fistula itself. The treatment is that of abscess, and not that of fistula, and is especially directed toward the prevention of fistula.

Should the abscess have been neglected till it has opened externally, it is still essentially an abscess and not a fistula, and the treatment described may still be carried out with a fair prospect of success in avoiding an opening into the bowel. I wish to emphasize this point strongly, for I have seen very unfortunate results follow free division of both sphincters for deep abscess, and it is a step which should always be avoided if possible. That it is possible in this class of cases I have occasionally proved to my own satisfaction, and I do not hesitate now to try every means with which I am acquainted, at any cost of time to the patient, before resorting to the usual plan of dividing everything between the abscess cavity and the bowel.

If, however, the case has been neglected till an internal open-

ing has formed and the skin over the ischio-rectal fossa has also become perforated—if, in other words, several weeks have gone by—the abscess will probably have to be laid open into the gut to secure satisfactory healing.

Abscess of the Superior Pelvi-rectal Space.—The other variety of deep rectal abscess is that in which the pus is formed around the rectum above the levator ani muscle in what is known as the superior pelvi-rectal space, or in the lower pelvis. The superior pelvi-rectal space is shown in diagram in Fig. 43, and is best described in Richet's own words :[1]

"The superior pelvi-rectal space, contained between the superior aponeurosis of the levator, the peritoneum, the rectum, and the walls of the pelvis, has a variable extent in different subjects, and especially varies according as the levator is or is

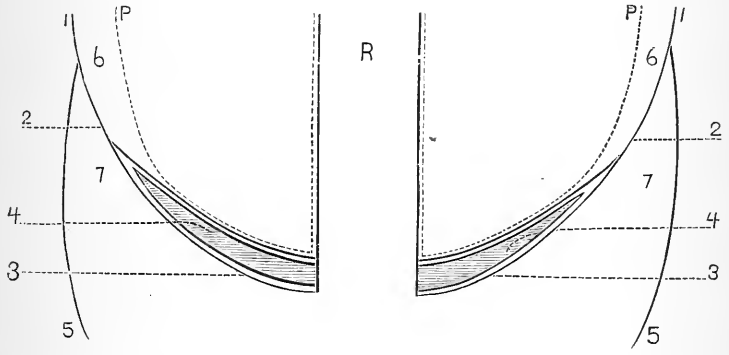

Fig. 43.—Diagrammatic View of the Pelvic Diaphragm as seen in a Lateral Vertical Section through the Pelvis on a line with the Rectum. R, rectum; 1, undivided pelvic fascia; 2, recto-vesical division of the pelvic fascia; 3, anal fascia lining the under surface of the levator ani; 4, levator ani muscle; 5, obturator division of the pelvic fascia; 6, superior pelvi-rectal space of Richet; 7, ischio-rectal fossa; P, peritoneum.

not relaxed. Its greatest extent is reached when the muscle is in repose. In this condition the levator in its upper part is in contact with the ischiatic walls, the lower end of the rectum is much lowered, and the summit of the infundibulum is as distant as possible from the peritoneum; while the contractions of the muscle efface the rectal funnel and approach it to the point of reflexion of the peritoneum. At its anterior part the pelvi-rectal space is much less extensive than at the sides and especially behind, which is due to two causes : the first is that the peritoneum, which is much lowered in front of the rectum to form the recto-vesical *cul-de-sac*, gradually rises behind to meet

[1] "Traité d'Anat. Méd. Chir.," 3d edit., p. 828.

the sacrum; the second is that the plane formed by the levator inclines in a reverse direction to the former, that is, from the prostate to the coccyx. Therefore these two planes are separated in front by scarcely a few millimetres, while behind they are several centimetres apart. An abundant cellular tissue with large and lax meshes fills the whole space, and seems intended to favor the movement and expansion of the rectum; rarely it is loaded with fat. In front and laterally this tissue communicates with that which fills the iliac fossæ and the deeper regions of the abdomen through the intervention of the subperitoneal cellular layer of the pelvic walls, and in women it is continuous with that of the broad ligament; behind it is continuous with that found in the meso-rectum and the concavity of the sacrum, and it communicates with the gluteal region by the sciatic notch. It is traversed by the visceral branches of the hypogastric artery and vein; the sacral plexus, and the ganglia of the great sympathetic against the sacrum, are covered by it.

"In men the superior pelvi-rectal space is separated from the prostate, the seminal vesicles, and the *bas-fond* of the bladder by a cellulo-fibrous layer called prostato-peritoneal. In women it may be said not to exist anteriorly, because the rectum is applied without intervention to the posterior wall of the vagina."

It is easily understood from this description why abscesses in this location may assume such vast proportions, burrowing laterally into the subperitoneal connective tissue of the iliac fossæ, or almost anywhere else in the true pelvis; discharging into the bladder, vagina, or rectum high up; mounting above the bladder or pointing in the groin or loin, passing downward out of the pelvis into the thigh, and causing retention of urine or intestinal obstruction by pressure.

These abscesses are due to the same causes as those last described and to some others. They have been seen to follow parturition, and are then due either to injury inflicted by the head of the fœtus or to blood poisoning. They are also secondary to diseases of the urinary organs, such as gonorrhœa, acute inflammation of the prostate, or rupture of the urethra and extravasation of urine. They may be due to foreign bodies either swallowed or introduced *per rectum*. A hairpin introduced *per anum* has been known to work its way into the sigmoid flexure, and after two years cause fæcal abscess opening in the lumbar region, over the great trochanter, and finally into Scarpa's

space, the case having for some time been mistaken for hip-joint disease.[1] The perforation of the gut by a rectal bougie or by the point of a syringe, and the landing of an enema in the perirectal cellular tissue, will set up this form of disease. Finally, for lack of known cause, we are obliged to consider some of them as idiopathic.

Symptoms.—In an abscess of the superior pelvi-rectal space the symptoms are often obscure and far from characteristic. There is more or less vague pain in the pelvis and lumbar region, which is seldom intense and is generally increased by defecation. Fever may be entirely absent, is seldom continuous, and chills are only occasionally met with when pus is formed. On the other hand, the patient may soon sink into a typhoid condition with high temperature and diarrhœa. Vesical symptoms are more marked than intestinal ones, for there is apt to be great vesical irritation with incontinence or retention of urine.

The following cases will serve to illustrate the general character and course of the disease:

Case.—*Abscess of the Superior Pelvi-rectal Space opening into the Bladder.*—Dr. M——, aged fifty-three. The patient was in his usual good health until the morning of April 3d, when he experienced some pain in the rectum and some difficulty in micturition, with pain in the act and frequency in the desire. This pain was shortly followed by a chill and high fever, the temperature reaching 103° F. and the pulse 120. The fever and pain lasted about one week, at the end of which the difficulty in urination had become so great that he was obliged to use the catheter upon himself for one day. During this time he was also suffering greatly from constipation, and was forced to use cathartics and enemata to induce a motion. He also noticed that when the enemata were ejected they were always squirted off toward the right side and expelled with a violent spasmodic action. The pain had also become distinctly localized in the left side of the pelvis and near the bladder.

Three weeks from the time of the first chill he passed a large quantity of pus from the bladder. The discharge was very free, amounted to many ounces, and lasted with each act of urination for three days, after which it ceased entirely. After a short interval he began again to have fever and chills with the same rectal and vesical symptoms, and after two weeks of suffering there was another discharge of pus by the urethra,

[1] Rev. Méd. de l'Est., February, 1885.

which this time lasted four days and then began to diminish gradually, so that at the end of six weeks it had again ceased. He had never recognized pus in the fæces, but there was much mucus, and once something that seemed to him like a slough.

An examination showed an indurated mass on the left side of the rectum above and to the left of the prostate, which was not enlarged. This mass was painful to the touch, but I could not decide that it contained pus to any considerable amount. The patient was pale and thin, and showed the effects of the sickness and suffering; but as there was no indication for operative interference with the cure nature seemed to be effecting, I advised him to spend some time at the seashore and await further developments.

A week later the patient brought me some long shreds of tenacious mucus which he was in the habit of passing from the bowel. He located most of his pain up under the rami of the pubes, and said that at times it was of that peculiar sickening character which comes when the testicle is wounded. Another examination was made, but revealed nothing new. The tenderness was at a point three or four inches from the anus on the left lateral wall of the bowel, and at this point there seemed to be a central softening in the induration. He was advised to continue the same plan of treatment, which consisted in rest, change of air, laxatives, nourishing food, and suppositories of belladonna and iodoform; and about a fortnight later he found himself greatly improved, and went on from that time to a complete recovery.

More recently I have had another case of the same form of disease. The patient, a carpenter, aged about forty-five, previously in good health, was taken suddenly with pain in the rectal region, fever, and chills, and was treated for ten days for piles, no examination being made. When seen by me in consultation there was found a large, brawny swelling on the right buttock and marked tenderness deep down in the right groin. A deep incision into the buttock reached pus, and when this was evacuated the finger exploring the cavity reached easily the promontory of the sacrum, and it was evident that the disease had extended a considerable height into the pelvis. The cavity was cleaned of débris as thoroughly as possible, syringed out with boracic acid solution, and drainage tubes inserted. Subsequently the case did well and no fistula resulted, though the cavity took several weeks to close.

Many of these deep pelvic abscesses never approach the sur-

face in the anal region, and the pus must be evacuated either by laparotomy or by incision through the rectum or vagina. I have had a fair proportion of these cases, and they are very interesting. Each of the following illustrates more than one point in diagnosis or treatment:

Pelvic Abscess in a Child.—A child of five years. Had always been in ordinarily good health, and was first seen by me September 4th, 1885, with the following history: Six days before, he began to have fever, pain on defecation and urination, and diarrhœa. These continued steadily for four days, when he had a slight chill, and on the second day following he was examined by Dr. Emerson, who suggested the propriety of a rectal examination. This was made on the same day. I found the child was suffering greatly from difficulty in urination, and that there had been paraphimosis lasting for a short time. The diarrhœa had ceased and the passages had become solid, but there was still severe rectal pain on defecation, with rectal tenesmus and the frequent passage of mucus. The temperature in the axilla was 101° F. in the morning. Digital examination of the rectum revealed a painful tumor between it and the bladder, hard, of the size of a small egg, and projecting quite prominently into the anterior wall of the bowel at about the seat of the prostate in an adult. The diagnosis of pelvic abscess was made, a favorable prognosis was given on account of its location, and operative interference was delayed in the hope of spontaneous cure. The child was carefully watched for six days. The morning temperature remained at about 101°, and the afternoon at 103°, in the mouth. During this time there were two distinct chills. The pain and frequency of micturition increased steadily, and at one time there was severe pain in the glans penis, lasting from eighteen to twenty-four hours. On the morning of the sixth day from my first examination (the twelfth of the disease) the vesical symptoms grew decidedly more mild, and the tenesmus and pain in the rectum correspondingly severe, indicating that the pus was working toward the latter; and another rectal examination confirmed this by showing a decidedly increased prominence of the tumor in the direction of the rectum. On the following day the abscess burst spontaneously into the rectum and discharged several ounces of most offensive pus, and the temperature at once fell to normal. There was considerable sharp, spasmodic pain in the pelvis and down the thighs for several weeks after this, and the

bowels were loose, but the passages soon ceased to contain anything abnormal.

Four months and a half after, the child was again thoroughly examined on account of marked vesical irritation. He had gained in every way and had no rectal symptoms, but had much difficulty in retaining his water. The most careful bimanual examination, with a finger of one hand in the rectum and the other hand over the pubes, failed to detect any remains of the former inflammatory induration, and simple remedies were ordered. Two months after, the vesical irritation was much diminished and the little patient seemed in a fair way to perfect recovery.

There are several interesting points in this case, and first is the age of the patient. Though I have seen several similar cases in children between the ages of eleven and fifteen, this is the youngest which has come to my notice. Again, it is impossible to tell the cause of the trouble. There had been no local injury, either internal or external, as far as was known, and the child had no constitutional taint. For lack of better explanation we were forced to suppose that he might have had a slight fall upon the buttocks or sat too long upon the wet sand of the seashore. The combination of symptoms—pain in urination and defecation, fever, and the presence of a painful tumor—rendered the diagnosis easy, and the wisdom of abstaining from operative interference was justified by the result. With an abscess low down in the pelvis as this was, pressing upon the rectum and protruding into it, it was considered that the chances greatly favored a spontaneous opening into the bowel. Nevertheless there was a risk that it might open somewhere else, as into the bladder, or into both rectum and bladder, establishing thus a communication between the two, and in another similar case I should advise an early puncture and incision. The rapid recovery from the worst symptoms after the discharge of pus, and the continuance for weeks of the symptoms pointing to the pressure effects of inflammatory exudation, are also quite characteristic.

Case.—Boy, aged twelve; slight and of delicate build, but generally well. Has had pain in the abdomen for the last forty-eight hours. Pain on urination and defecation, and tenderness all over the lower part of the bowels, but without localization at any one point. Temperature 103° F. Pulse 130. Two soft evacuations from bowels yesterday.

Next day (third of disease) he "thought it hurt him more

on the right side than on the left when he tried to stand up," and there was some dulness in the right fossa, but no swelling. Has vomited his milk once.

Fourth day: Temperature has continued to range between 101° in the morning and 103° in the afternoon. Passed a very restless night and begins to show signs of suffering. There is flatulence, but not as much distention of the abdomen; vomiting and vesical tenesmus continue. Has had no chill. The tenderness is now confined to the right fossa, and is greatest at a point half-way between the anterior superior spine and the pubes, and above a line running from one anterior superior spine to the other, where a slight tumefaction can be made out by careful palpation. No superficial redness. Bowels have not moved since the first day. On consultation with Drs. Sabine and Bullard it was decided that an operation was not immediately indicated, and the same treatment, quinia, morphia, wine, and fluid diet, was continued.

Sixth day: Marked relief of all symptoms; less pain, less tenderness, four free fluid evacuations from the bowels in rapid succession, fall in temperature and pulse, appetite better, and had a good night's sleep.

From the sixth to the thirteenth day there was little change. The bowels moved daily, but always with more or less pain, and the appetite and strength returned in a measure, so that he was able to leave his bed. But the temperature daily showed the same increase above the normal, never falling below 100°; and the pain and tenderness did not diminish. For a day or two the parents had remarked a peculiar bubbling noise, which they heard at times at the seat of the tumor, and on the twelfth day a part of the dulness was found replaced by clear tympanitic resonance, and the diagnosis of a communication between the rectum and the tumor was made. On the thirteenth day he had a very free, fluid, and offensive discharge from the bowels, which the parents said contained pus, followed by a marked fall in temperature and diminution in the pain, and for the next two days he was comparatively comfortable.

Sixteenth day, evening: Complaining of great pain, rolling and tossing in bed, and screaming with agony. Found him lying on his right side, legs drawn up, sphincter ani relaxed, mucous membrane slightly protruding, and a small stream of clear mucus flowing from the anus and staining the bed. The rectal tenesmus was very great. He had passed a small amount

of fæces during the morning, and had passed most of the day sitting up in bed, enjoying his supposed convalescence.

Digital examination of the rectum revealed a hard tumor pressing upon and almost closing it, situated on the anterior wall to the right and above the prostate. Large dose of morphine given to quiet him during the night.

At my visit next morning he was more comfortable and the tenesmus had in part ceased. Had passed nothing *per rectum*. On turning him on his back I was surprised to see what appeared to be a greatly distended bladder reaching nearly to the umbilicus and plainly outlined against the abdominal wall. He had passed his water twice during the night, he said, and was not suffering from any desire to do so. Stupes over the abdomen brought away only four ounces of urine (by measure) and caused the entire disappearance of the visible tumor. The dulness and the hardness to the touch still remained, however, and extended half-way from the pubes to the umbilicus. Under ether he was catheterized and three more ounces of urine withdrawn, thus entirely emptying the bladder, but causing no change in the tumor, which occupied the place usually occupied by a distended bladder.

By careful examination the following condition was then made out: A firm, hard tumor in the pelvis toward the right side, the upper edge of which could be felt by deep pressure about half-way between the pubes and the umbilicus, and the lower surface of which could be felt with the finger in the rectum. The pressure upon the rectum was nearly sufficient to occlude it, and it was with difficulty that the limit of the tumor above could be made out in this way. The mass could not be made to fluctuate by this conjoined manipulation. A medium-sized aspirator needle was thrust into the tumor from the abdominal wall, and a pint of fetid, greenish pus evacuated. The point of the needle was then used as a director and could be felt by the finger in the rectum. It was cut down upon from the rectum and a free vent allowed for the contents of the abscess in this way at its most dependent portion. The end of the index finger passed through this incision into a large abscess cavity, the limits of which could not be determined.

By a daily introduction of the index finger into the incision it was kept open; more or less pus was evacuated in the stools for some time, and the abscess finally healed very kindly. One year after the operation the boy was still in perfect health.

Diagnosis.—The diagnosis of deep pelvic abscess will not

often be made before the tumor becomes apparent or the pus has discharged itself. After a few days of sickness a hard, painful tumor appears in the lower part of the abdomen, or a free discharge of pus takes place from the rectum or bladder, and the cause of the previous symptoms becomes apparent. The rupture may occur into the peritoneal cavity and a general peritonitis result, though in men the tendency is rather downward along the rectum to the perineum. Careful digital examination of the rectum will often render an otherwise obscure case perfectly plain. Even when the diagnosis of pelvic abscess has been made, it may be impossible for a time to decide upon its origin, for psoas abscess, abscess from hip disease, perityphlitis, periproctitis, perinephritis, and inflammation in the connective tissue of the iliac fossa, may each cause a collection of pus in the pelvis. After pus has been obtained, should the origin not be plain, a microscopic examination for bone tissue may make it so.

Prognosis.—The prognosis is necessarily grave. In the beginning the patient is exposed to all the dangers of pyæmia, peritonitis, and phlebitis; and should the abscess go on to a favorable termination in an external opening, there is still the dread that it may at any time seek another opening toward the peritoneum with a fatal result, or burrow in some different direction from the first. The immediate results being favorable, the ultimate ones may still be disastrous; being those which always attend upon prolonged suppuration—visceral complications, amyloid degeneration of the liver and kidneys, and tubercular deposits. In the comparatively small number of cases of pelvirectal abscess in which spontaneous healing occurs, the patient still has to meet the results of extensive cicatricial contraction. These may be stricture on the one hand, or incontinence on the other, with the subacute inflammatory tendency which is always apt to attend upon a cicatrix at the anus and cause pain and uneasiness. In females especially, such a cicatrix may be the cause of grave trouble with the genito-urinary canal.

The reasons why abscesses in this region so seldom heal spontaneously are to be found in the anatomy of the part and the mobility of the walls of the abscess cavity. The walls of the abscess move with the varying fulness of the abdominal or pelvic organs, with the incessant action of the levator ani, and with the fulness or vacuity of the abscess cavity, which depends on the intermittent discharge of pus through its small opening.

Regarding the termination of the abscess, Ségoud has col-

lected important statistics. Thirty-five perforated the urethra, and seventy-seven other parts, generally the rectum, but occasionally the perineum, the ischio-rectal fossa, and the obturator foramen. Twenty per cent are fatal, and many leave fistulous communications with the urethra or rectum which are never cured.

The treatment of deep abscess may now be described in two words—incision and drainage. The incision should be made as soon as the diagnosis of the presence of pus is reasonably established, in order to avoid the dangers of burrowing. It is true that these abscesses tend naturally to discharge themselves safely into the rectum or bladder, and that by waiting for this an operation may often be avoided; but such timid surgery is attended by great risk. If the pus be approaching the surface through the perineum, the incision should be made here to facilitate its escape; if toward the rectum or vagina, it should be met through these cavities; should it appear in the groin or thigh, free incisions must be made for its outlet; and should a tumor arise in the iliac fossa or above the bladder, the operation must be done through the abdomen. The incision must be free enough to allow of the escape of all the contents, washing out the abscess cavity, and the establishment of thorough drainage.

The usual treatment of these abscesses has been to incise them through the rectum when they have pointed in that direction, but Zeller has recently advocated a perineal incision whenever possible, even after pointing has taken place into the rectum. He objects, very properly, to the incision into the rectum that it is too small, does not tap the abscess at the most dependent part, is not free from risk of hæmorrhage, and does not prevent the formation of urethro-rectal fistula, which is much more intractable than urethro-perineal fistula. From my own experience I should judge that a perineal incision would seldom be practicable.

CHAPTER VI.

FISTULA.

A FISTULA which is not due to ulceration and perforation of the rectal wall from within is the result of a previous abscess, and, therefore, in enumerating the causes of abscess those of fistulæ have also been given. Like the abscesses from which they arise, they may well be divided into superficial and deep; or into those of the anus, which are subcutaneous and involve at the most only a few fibres of the external sphincter, and those of the rectum and pelvis, which open into the bowel at a higher point, or perhaps on the surface at a considerable distance from the

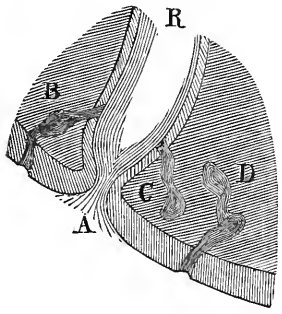

FIG. 44.—Varieties of Fistula (Gosselin). A, anus; R, rectum; B, complete fistula; C, blind internal fistula; D, blind external fistula.

rectum. Both the superficial and deep may also be divided into the complete, or those which open both on the skin and into the bowel; the external, which open only on the skin; and the internal, which have an opening only within the bowel. (Fig. 44.)

Superficial Fistulæ.—On account of the special laxity of the submucous connective tissue in this region, already noticed, abscesses show little tendency to spontaneous closure, and fistula is the common result when left to their own course. In the subcutaneous fistula, the external orifice may be at some distance from the anus or in the radiating folds. It may be so small as to escape the eye in a cursory examination, unless a drop of pus

chance to be squeezed out of it by the pressure of the fingers in pulling open the parts; and when discovered, it may not admit the end of an ordinary probe. The surgeon should, therefore, always be provided with a probe of small size and of pure silver, which admits of being readily bent, for use in these examinations.

The presence of more than one external orifice is rare in subcutaneous fistulæ; and an internal opening will be found in the great majority of cases, if properly searched for. The best way to settle the question of the presence or absence of an internal opening in any doubtful case is by injecting milk through the external orifice. In the vast majority of cases the milk will be

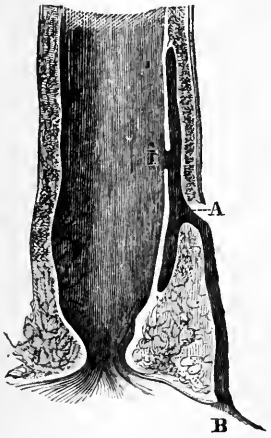

FIG. 45.

FIG. 46.

Fistulæ with Double Tracks. (Mollière.)

FIG. 45.—A B, deep submuscular track resulting from an ischio-rectal abscess. A I, submucous track running up and down the bowel.

FIG. 46.—D E, subtegumentary and submucous fistula with internal and external opening. D F, deep submuscular track, having same internal, but separate external opening.

found in the rectum, and the internal orifice will be found just within the external sphincter. It may sometimes be felt in this location by the educated finger as a small tubercle, and in other cases it is marked by a distinct loss of substance. In some the internal opening will be found in the radiating folds entirely below the fibres of the sphincter, and in others it may be much higher up the bowel.[1]

The internal orifice does not in all cases mark the superior

[1] Ribes: "Recherches sur la Situation de l'Orifice interne de la Fistule de l'Anus," Rev. Méd., t. i., 1820.

imit of the fistulous track. This may run several inches up the bowel under the mucous membrane when the internal orifice is just within the external sphincter. (Figs. 45, 46.)

The track of a fistula is sometimes straight, extending directly from one orifice to the other ; in other cases a track, properly speaking, does not exist, and both orifices open directly into the original abscess cavity. If the external orifice be very small, the cavity may at any time become distended with pus and give rise to all the symptoms of a fresh abscess till the pus finds an exit through either the old opening or a new one. The external orifice of a true, straight fistulous track is generally large, and sometimes free enough to allow of the escape of gas. The track is lined with lardaceous tissue the result of chronic inflammation, and in this may be found numerous blood vessels of new formation. This tissue, by preventing all contact of the walls, necessarily prevents healing. On the other hand, the track is sometimes lined with healthy granulations which are capable of being formed into new tissue, and for this reason a fistula will sometimes heal spontaneously.

The history will sometimes afford valuable information as to the general character of the case. The history of a slight abscess and the escape of a small amount of pus generally means an insignificant fistula with external and internal openings near the margin of the anus; while, on the other hand, the history of a prolonged inflammation and a free discharge of pus means a large abscess cavity mounting to a considerable height and with its internal orifice at a correspondingly high point.

The symptoms caused by this class of fistulæ vary greatly. At first they are those of the abscess in which they originate. After that the one great symptom is the incessant discharge, sometimes slight, at others abundant; sometimes purulent, at others serous ; always fetid ; sometimes containing fæces and gas. It is generally the stoppage of the discharge and the consequent filling of the track or abscess cavity which induces the patient to seek the surgeon. Besides the discharge there may be no symptoms at all, or there may be more or less uneasiness in the part, and pain on defecation, with the constipation which arises from the fear of a passage, and the symptoms to which it gives rise. Such a state of affairs may exist for many years without aggravation or causing the patient to seek relief.

Fistulæ resulting from ischio-rectal abscesses differ greatly in their extent and gravity from those last described. In them the track is large, and often double or branching, and the

external opening may be far away from the anus. The whole perineum and gluteal region will sometimes be found brawny and indurated, and twenty or thirty openings may be counted, with the scars of others which have closed. In such cases pressure over one trochanter may cause pus to escape from an opening over the other.

The fistulæ resulting from the deep pelvic abscesses are of many different varieties, all of them severe. The track is deep, and the probe passed into it can hardly be felt from the rectum. The external opening may be far away from the anus, and there may be several tracks and openings which may branch off from each other, or all communicate with a common abscess cavity above the levator ani muscle.

The track in some of these cases has been known to take a remarkably irregular course. Sir A. Cooper[1] mentions an autopsy where a fistula opened in the groin, followed the course of the spermatic cord, and ended in what seemed like an ordinary fistula in ano; and cases in which the pus has burrowed under the gluteal muscles and finally opened in the thigh, or even nearly at the popliteal space, are not uncommon. This form of disease is rather more common in males than in females.

Blind Internal Fistula.—Fistulæ with internal openings alone have a somewhat special pathology. When caused by an abscess it is generally by one of the deep variety which has opened into the rectum high up and continues to discharge in this way. The abscess causing such a fistula may, however, be a small submucous one or a large subcutaneous one, and the symptoms will then be pain, spontaneous discharge of pus from the bowel, and subsequently pain after defecation resembling that of a fissure. There is another and perhaps more common class of internal fistulæ in which the opening is not the result of the breaking of an abscess, but in which the opening is first formed by ulceration, and the track is a secondary consequence. This pathological fact was proved by the well-known investigations of Ribes, who believed that the internal orifice was always the first formed; but here he was undoubtedly in error.

A circumscribed ulcer which perforates the mucous membrane and results in internal fistula may be due to several causes: to the inflammation of one of the lacunæ just above the sphincter from the lodgment within it of a particle of hard

[1] "Lecture on Principle and Practice of Surgery," with notes by Tyrell, t. ii., p. 326.

fæces; to rupture of an inflamed internal hæmorrhoid; to the application of strong acids to hæmorrhoids; to operations upon the rectum, generally for hæmorrhoids; and to the peculiar ulceration met with in tubercular patients.

Such a condition is a very painful one. The opening, which may be large enough to show a distinct loss of substance to the touch, catches and retains particles of fæces, causing a burning pain which may last many hours after defecation. As a result of the opening an abscess forms after a time, with the usual symptoms, the induration of which may be felt externally. When the abscess is small and the induration not extensive, a speculum examination may reveal the ulcer; but the fistulous track and abscess may escape—a mistake which will render all treatment directed toward the cure of the ulcer of no avail. There may indeed be several ulcers, only one of which has a fistula connected with it.

Fistulæ of this variety differ very much in character; but taking them as a class, I know of no branch of rectal troubles so apt to lead to errors in diagnosis or mistakes in practice. Some of them are perfectly apparent by even a cursory examination. The internal opening may be so large that the finger enters an abscess cavity on introducing it into the anus, while the skin of the ischio-rectal fossa is reddened and thinned and the pus is about to break through the surface. This condition is most frequently seen as a result of ulceration of the rectum in phthisical patients. On the other hand, the internal orifice may be so small as scarcely to admit the finest probe, there may be only a small straight track and no abscess cavity, and the condition may require the most thorough and careful examination under ether for its detection. The patient may complain only of pain strongly resembling that of fissure or simple neuralgia of the rectum, and the purulent discharge may be so slight as to escape notice.

It has been my good fortune to cure a fair number of these cases; and when a patient's trouble is evidently obscure, when he has tried many kinds of treatment without benefit, I have learned to suspect and search for them, more especially when a small ulcer is found in the rectum. The base of an ulcer cannot be examined too closely; nor can the rectum of a patient who complains only of pain without apparent lesion.

Tubercular fistula, like tubercular ulceration of the rectum and anus, occurs in two forms. In one there is a distinct tubercular deposit causing the disease; in the other there is merely an

unhealthy sore in a tubercular patient. The former can be definitely diagnosticated by microscopic examination for the bacillus. The occurrence of primary tuberculosis in this locality, though rare, is not entirely unknown. Ball reports a case and Mollière one ; but generally the state of the patient's lungs will indicate the nature of the pathological process in the rectum.

These fistulæ are generally easily diagnosticated by the large internal orifice, showing a distinct loss of substance and a cavity which will allow the entrance of the tip of the finger ; by the undermined and unhealthy appearance of the skin around the external orifice ; by the size of the abscess cavity, the absence of healthy granulations, and the thin and sanious character of the discharge.

Diagnosis.—The mere diagnosis of the existence of a fistula, except in the blind internal variety, is usually attended by little difficulty. The examination of the extent and variety of a fistulous track, however, is a matter requiring delicacy and skill. The best position is on the side with limbs flexed on the abdomen. The examiner should be provided with probes of every variety, from the small, pure silver one shown in Fig. 52 to the urethral bougie or hard-rubber uterine probe; and it is better not to begin the examination with any preconceived idea as to the direction of the track, for this is exactly what the probe is to determine. The instrument should be allowed to follow the track, and not be forced toward the gut, or indeed in any direction. After it has gone as far as it will, the index finger of the other hand may be introduced into the rectum and try to detect the end of the probe. Sometimes it will be found free in the rectum; sometimes it can be felt covered only by mucous membrane, but no internal opening can be discovered ; and again, rather to the surprise of the operator, it may not be felt at all, having passed directly away from the bowel. I must confess that in my own daily practice, for reasons which will be better shown under the discussion of treatment, I do not usually devote much time to the discovery of the exact extent and character of a fistula until the patient is under ether and on the operating table. The vast majority of them have to be cut, and in the operation their course becomes manifest.

In the diagnosis of the blind internal variety there is a chance for much skill. I have known a case of a small fistula of this kind to escape detection by a dozen different men, and to be treated for almost every other form of rectal affection. The absence of any external orifice misleads the superficial

examiner at the beginning, and the failure to make a thorough examination completes the error.

There are two signs of this condition which will in every case lead to a correct diagnosis. The one is the discovery of the internal orifice, the other the induration which invariably attends a track of any size. Again, there is something significant in the history, and I have learned by experience, when a patient gives all the usual symptoms of fissure and yet has no fissure, to examine under ether for a blind internal fistula. I say examine *under ether* advisedly, for a complete examination without ether and a large-bladed speculum is an impossibility. Often a careful search over the lower three inches of mucous membrane will reveal a small ulcerated opening, and a probe passed into this will run for an inch or so under the mucous membrane.

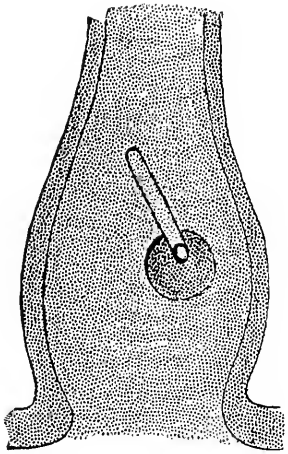

Fig. 47.—Blind Internal, Submucous Fistula from Carbolic Acid.

In other cases the finger will first detect an indurated spot or track, and a careful examination of this will show the opening of the fistula. In the submucous variety there is little or no induration, while in the submuscular the induration is likely to be distinct.

This variety of fistula is not, in my experience, very uncommon. It may arise from an abscess which has pointed into the rectum and not on the skin, or it may be due to an inflammatory or ulcerative process commencing in the rectal wall and resulting in perforation, such as tubercular disease. It is sometimes caused by inflammation of an internal hæmorrhoid, and I

have seen several cases directly and unmistakably due to the injection of carbolic acid into hæmorrhoids.

The acid not infrequently sets up a circumscribed inflammation, which results in a small abscess breaking on the mucous surface and burrowing under the mucous membrane, if it has been deposited directly under the surface; or under the muscular coat, if it has been more deeply placed. These fistulæ are generally not very extensive, the track being an inch or so long and generally single, unless more than one injection has been followed by the same result. In a feeble patient with phthisis and relaxed fibre I have seen the mucous membrane undermined in almost every direction as a result of a course of treatment with injections of thirty-three per cent acid; and in a patient of different fibre I have seen a large abscess of the ischio-rectal fossa, with brawny swelling of the buttock, bursting high up in the rectum, follow an injection of the pure acid.

The larger the abscess and the larger the opening into the rectum—it is sometimes so large that the end of the finger will pass into it—the easier the diagnosis. It is only the lesser forms of the disease that are liable to be overlooked, and yet even the lesser ones may render a patient's life very miserable.

There are two other points in the diagnosis of this affection that may be useful. One is that the internal orifice when small may sometimes be detected by gentle pressure on the adjacent parts which shall force a drop of clear pus out of it; the other is that in cases of circumscribed ulcer which refuse to heal under treatment, a blind track leading from the base of the ulcer should always be carefully searched for.

Treatment.—A fistula may heal spontaneously or after a very slight excitement to reparative action, such as the mere passage of a probe in making an examination. It has been mentioned that the track is sometimes lined with healthy granulations, and that these may result in new tissue which shall close it. I have the notes of one such case where a fistula of several years' standing closed spontaneously without even the passage of a probe to excite it to reparative action.

Setting aside these cases, we are at once brought to the question which will often be asked by the patient, and which the surgeon may not always be able to answer to his own satisfaction—whether or not it is always best, or even safe, to try and cure a fistula. In certain cases of Bright's disease, cancer, cardiac and hepatic affections, etc., all surgical interference may be plainly contra-indicated; but the question is most apt to arise

in connection with pulmonary affections. There can be little doubt that phthisical patients are especially predisposed to this affection, and, when not due to a deposit of tubercle, the reason is probably in great measure a mechanical one, depending upon a loss of fat in the ischio-rectal fossæ and a resulting loss of support to the hæmorrhoidal veins. From this there results a venous congestion and final dilatation or rupture of the vessels, which, with the cough and concussion, leads eventually to abscess.

I believe it to be a safe rule to operate on phthisical patients as upon others; being led by the idea that one exhausting disease—phthisis—is better than two—phthisis and fistula. I have many times followed this rule with happy results as to improved general health after the cure of the fistula. Once only has it happened to me to see the cure of a fistula followed by a marked increase of the lung trouble, and even in such a case the relation between cause and effect cannot be established. There are several rules which should be carefully regarded in this class of cases, however. No cautious practitioner would think of operating either in a very advanced or rapidly advancing lung trouble. Cough, when violent and frequent, is also a decided contra-indication, interfering, as it does very certainly, with the healing of the wound. Moreover, in every case where there is any suspicion of tuberculosis the whole extent of the fistula should be thoroughly curetted.

The after-treatment of a phthisical patient is always a matter of great importance, for these incisions may refuse to heal even when they look perfectly healthy. The patient should not be confined to the bed any longer than is absolutely necessary, and if his general health is better in the open air he should be encouraged to go out as soon as the wound will permit, even though rectal wounds do heal better in the recumbent posture. But here the general health must take precedence. The diet should be the most nourishing possible, change of air should be sought, tonics of all varieties should be given, and the local treatment should be gently stimulating. It is often useless, however, to change local dressings and to worry over the wound. If the cut shows no tendency to heal, and there be no sinus to account for the sluggishness, it is the patient himself who must be cared for, and the particular form of dressing will make little difference.

In cases of fistula in phthisical patients the sphincters should be interfered with as little as possible. They are apt to be weak at the best, and the less cutting of them that is done the better.

Having decided, then, to try and cure the fistula, many ways are open. In certain selected cases a cure may be effected by stimulating the track and allowing a free discharge of pus without any cutting operation. For this purpose dilatation of the external orifice by sea-tangle tents, the introduction of drainage tubes, injections of turpentine and iodine, and applications of nitrate of silver and caustic potash have all been successful. Treatment by any of these methods requires time and patience, and the result cannot be looked upon as at all certain; and yet all of them hold out a prospect of success, if the patient be in condition to submit to their trial.

In cases of recent abscess of the ischio-rectal fossa where the pus has broken out on the skin but no internal opening has yet formed, the chances of success by this method are very good. The patient should be kept in bed and the outer opening be enlarged to allow of free escape of matter. Then by free drainage and injections of bichloride 1 : 2000 the abscess cavity is very likely to heal. In older cases where a true pyogenic membrane has formed, the applications must be much stronger, and in these turpentine, iodine, or caustic potash will succeed much better.

When it has been decided to lay the fistula open into the gut, there is but one method which can be thoroughly recommended, and that is the knife. The elastic ligature and *écraseur* need not be considered except in cases where the incision is so deep that concealed hæmorrhage is to be feared and guarded against. In ordinary cases involving only the ischio-rectal fossa, the silk ligature is unsurgical and the elastic ligature and galvano-cautery wire possess no advantages.

Incision.—The operation for fistula by incision may be greatly facilitated by the observance of several minor details. In this, as in other operations on the part, the bowels should be thoroughly emptied on the previous day. Care must be exercised lest in the endeavor to free the alimentary canal a diarrhœa be excited, for this will prove anything but an agreeable complication for the operator. In all cases in which the track is of any considerable depth, or in which, on account of sensitiveness of the patient, the surgeon has not been able to assure himself of the exact extent of the disease and the absence of any side tracks or diverticula, ether should be given and the anus gently and completely dilated before the operation. It is only in the simplest cases that the incision may be made without ether, and then the best chance of a thoroughly satisfactory

exploration is missed, and the way is opened for an incomplete and therefore unsuccessful operation.

With regard to position, the operator may choose between placing the patient on the affected side or on the back, though for myself I prefer the latter with Clover's crutch.

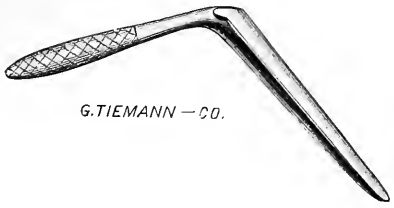

Fig. 48.—Gorget.

For deep tracks the knife should be strongly made, for it is not a very difficult matter to break an ordinary scalpel in a deep fistula. A heavy steel director may also be snapped in an attempt to bring the end out of the anus preparatory to making the incision ; and should the internal orifice be high up, and the external at some distance from the anus, so that the amount of tissue to be divided is large, it is often better to use the wooden

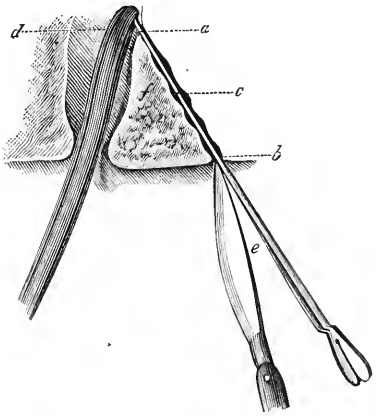

Fig. 49.—Operation for Fistula with Gorget. (Bernard and Huette.)

gorget to guard the opposite side of the rectum, and dispense with the director after the knife has been passed. (Fig. 48.) The end of the knife may be firmly fixed into the wood and both withdrawn simultaneously (Fig. 49), or the incision may be made by cutting on the gorget. Allingham prefers a pair of

spring scissors, one blade of which runs in a director the groove of which is more than a semicircle, for cutting deep tracks. (Fig. 50.)

When no internal orifice can be found, but the mucous membrane feels undermined and the probe can be felt by the finger in the rectum, separated only by a thin layer of mucous membrane, it is a good plan to force an internal opening and treat the fistula as though it were complete. When there are two internal openings, both should be included in one incision. When, after the incision, the diseased integument is found to overlap the cut and hang into it, it should be cut away; and in old tracks the healing may be hastened many days by thoroughly scraping out the lardaceous wall with the handle of the scalpel, or even scarifying it in several places, so that a healthy reparative action may be set up.

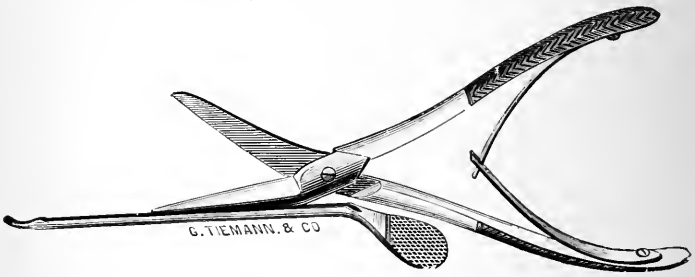

Fig. 50.—Allingham's Spring Scissors for Fistula.

Where the fistulous tracks exist in great numbers—twenty or thirty in some cases—two or three operations may be advisable at intervals, rather than to attempt to do all at one sitting, lest the patient's reparative powers should be unequal to the task thrown upon them. In such cases there will often be found two or three tracks which may be considered as primary, into which the others run; and each of these, with its branches, may be dealt with at a separate operation. Many of the tracks will be found to run away from the bowel under the skin of the buttock or toward the scrotum, and these may be induced to heal by laying them open, without interfering with the sphincters. It will sometimes be necessary to divide the sphincter several times, however, before the cure can be completed, and a certain degree of incontinence may be expected as a result.

In such cases the anal region is generally greatly hardened and infiltrated, and free hæmorrhage may be expected. The best weapon with which to meet it is the cautery of Paquelin.

In the matter of dressings after the incision much skill may be displayed. Immediately after the operation a dressing of dry picked lint, or, if there be an abscess cavity, of lint soaked in carbolized oil, is as good as any, and this should be kept in place by a T bandage. To save the patient as much pain and annoyance as possible, this should not be removed till suppuration has been established. Subsequent dressings may be of the same material and should be changed daily. The wound should not be tightly packed with lint. It will heal from the bottom if its surfaces are kept apart or separated daily by the finger of the surgeon. Care is always necessary to prevent an immediate union of the cutaneous edges of the incision. I have seen a remarkably well-pleased patient come to me and report himself as entirely cured a week after I had divided his fistula, in consultation with his medical attendant, and have found on examination that the incision had healed very kindly by first intention through its whole extent, and that the fistulous track was exactly as it was before the cut. In my own practice I seldom use any dressing at all after the first, but merely introduce a finger into the wound two or three times a week to secure healing from the bottom.

Healing may be indefinitely delayed by too frequent dressings or by stuffing the wound tightly with lint, with the intention of forcing it to heal from the bottom. Under such treatment healthy granulations may entirely disappear, and the cut surface assume a mucous-membrane-like appearance and so remain. Standing or walking always delays, and may sometimes entirely prevent healing.

During the treatment the burrowing of pus and the formation of a new pocket should always be carefully watched for and met by incision.

The hæmorrhage in an ordinary operation for fistula is seldom profuse enough to cause the surgeon any uneasiness, and is almost always easily controlled by packing the incision with lint and making firm pressure with a compress held in place by a T bandage. A free arterial hæmorrhage from a vessel well up the rectum may, however, be alarming, and if not controlled by the admission of air or the application of ice to the part, the rectum must be tamponed.

Under the most favorable conditions a fistula which is but a straight track may require so large an incision that a couple of months may be required for healing. Dr. Emmet has succeeded in saving this long delay by a simple method of introducing

deep sutures to approximate the sides of the cut. The old pyogenic membrane must first be completely removed and the track put into condition to heal by first intention. Two or three wire sutures are then introduced to draw the deeper parts of the cut together, and the edges are approximated carefully with catgut. If the attempt be successful much time will be saved, and if it fail nothing is lost.

The general idea of the operation of cutting a fistula in ano is a very simple one. It is that a director should be introduced into the external orifice, brought out into the rectum through the internal opening, or at a point where its end approaches most nearly to the mucous membrane, then bent and brought out of the anus, and that the tissues upon it should be cut.

This is the idea conveyed to the student by his lectures, and to the practitioner by his text books on general surgery; and in many, perhaps the majority, of cases this simple procedure will be curative, for many fistulæ are straight tracks running not very deeply into the tissues, and it is to them, and to them only, that the operation applies. But no practitioner will cut many fistulæ in this offhand, routine way before meeting with a case in which such an operation will either prove a signal failure or will result in irreparable injury to the parts.

Perhaps the first lesson taught by an unexpected failure in effecting a cure by this operation is that a fistulous track is something to be followed by a careful dissection, and not a thing to be laid open by a single sweep of the knife along a director which has, by more or less force, been entered at one opening and made to pass out at the other; for by this course not only is the track often left in great part undivided, but the director is forced into healthy tissue and parts are needlessly sacrificed.

Instead of this, the track should be followed step by step from its external opening along its whole course; and to do this the director need only be introduced a short distance at a time. By thus following carefully the course of the fistula, and dissecting it out to its end, no unnecessary sacrifice is made of adjacent healthy tissue, and side tracks or diverticula are recognized as they are met. This is much easier than to pick them out in the bottom of an extensive, bleeding, and irregular wound.

A word about the director. The one ordinarily used (Fig. 51) is too blunt at the end for fine work. It should be of steel, delicately made, and probe-pointed; silver is too flexible for ordi-

nary work. These have been made for me in three sizes by Tiemann.

With regard to side tracks or branching diverticula, the rule is that all such should be dissected up exactly as the main track should be; but to this there are very important exceptions. The rule may perhaps be modified in this way: As many tracks should be divided as can be done without risk of incontinence of fæces in either sex, or of destruction of the perineum in women, or of too great injury for the reparative powers of the patient.

As a rule, both the sphincters in either sex may be divided once in the median line without danger of incontinence. It is

Fig. 51.—Director.

better, however, to divide as little as possible. The inner should be left intact, if possible; the division should be straight across the muscular fibre, and not slanting: and a double division of one, and especially of both sphincters, should not be resorted to as a primary operation. In women and phthisical patients there is more risk than in men otherwise healthy.

In these modifications of the rule of complete division cases of tracks running upward along the bowel are not included, for these should be divided as are those nearer the anus.

Fig. 52.—Author's Director for Fistula.

Here the supposed danger of hæmorrhage often stops the operator with his work half-completed; and one of these tracks will often heal spontaneously after the opening of the lower one into which it empties. But it is not safe to trust to this chance. These upward branches are of two distinct kinds. In one the track runs directly beneath the mucous membrane, and may be so found with the director; and in this there is little danger of hæmorrhage in its division, for the blood vessels are all beneath it. In the other variety the track runs deeper in the wall of the gut, under the muscular layers, perhaps even away from the rectal wall into the perirectal tissues. In such cases there is

great danger of hæmorrhage, and the division may be more safely done with the elastic ligature or the enterotome.

The exceptions to this rule of complete division will be found in three classes of cases—those of the horseshoe variety, the recto-labial variety, and the old cases of extensive disease where the whole anal and perineal regions are riddled with openings. In these cases all the ingenuity the operator possesses will be demanded to effect a cure without resulting incontinence.

Horseshoe fistula has been defined differently by different writers. In a typical case it is a form of fistula in which there are one or more external openings on each side of the anus and

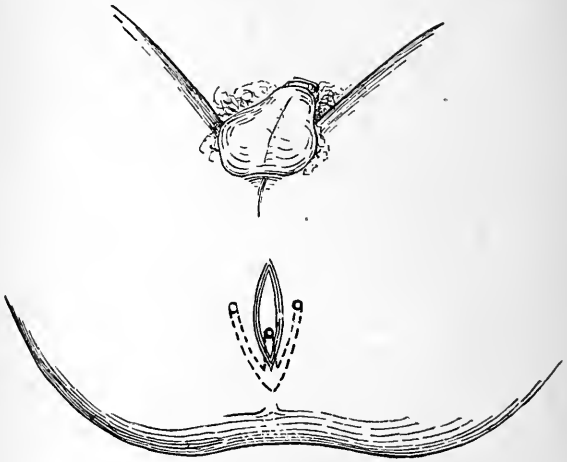

Fig. 53.—Horseshoe Fistula.

an inner opening in the rectum in the median line behind. It is shown in Fig. 53, after Goodsall.[1] But a horseshoe fistula may have only one external opening, and yet the abscess which has caused it may almost entirely surround the gut. Nor need the internal orifice be in the median line, either behind or in front. The name applies better to the shape of the abscess which has resulted in fistula than to the location of the openings. In this form of disease the pus in its burrowing has extended from one side of the gut to the other, and the resulting fistula may be complete, incomplete, or of the blind internal variety. The internal opening may be at any point, and the external may be on the opposite side of the body from it. (Fig. 54.)

[1] British Medical Journal, 1888.

In these cases I think it will generally be observed that the openings do not lead into distinct fistulous tracks of any great extent, but rather into one abscess cavity of considerable size.

It is evident that in operating upon such cases as these there is a chance for much skill in effecting a cure at one operation and still preserving the sphincteric power. And I may say that a patient who has been left with incontinence of fæces after this operation is apt to be very unforgiving, especially when it happens to be a lady who has been rendered loathsome to herself, afraid to trust herself in society, and doomed to the constant wearing of a napkin. I have seen several such, and by means to be referred to have relieved some, but from the ill-fortune of others I have come to warn my own patients that incontinence

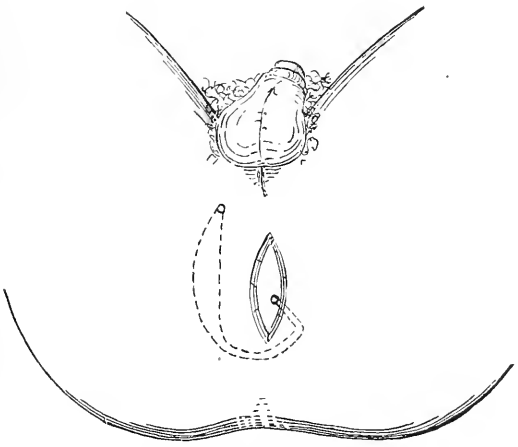

Fig. 54.—Horseshoe Fistula.

may possibly result, when I see any reason to anticipate such a conclusion.

Taking now a case of horseshoe fistula, such as is shown in Fig. 53. The ordinary operation would consist in two complete divisions of the sphincters on opposite sides (Fig 55), probably resulting in incontinence. The correct method, as is shown by Goodsall, consists in one complete posterior division, and then the opening of the lateral tracks into this posterior cut, as shown in Fig. 56.

This principle may be made to cover nearly all of this class of cases. Where several external openings are grouped around the anus they may all be connected by one incision, and from this incision a probe may be passed through the internal opening, and this, too, divided with the sphincter.

A more complicated case of the same variety is shown in Fig. 58, and the incisions by which it may be cured with but a single division of the sphincter are shown in Fig. 59, after Goodsall.

Fig. 55.

In case the external opening be at a considerable distance from the anus, and on the opposite side of the body from the

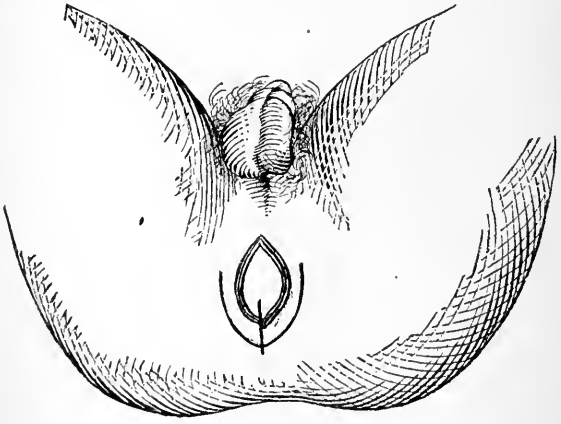

Fig. 56.

internal, as shown in Fig. 54—drawn from a case of my own—the method is essentially the same, the thing to be avoided being a slanting cut through the rectum and healthy tissue. By following the ordinary rule in such a case—passing a director

into one opening and out of the other, and cutting upon it—all but a small portion of the lower end of the bowel would be completely severed by a deep incision. Fig. 57 shows the cuts that were made by which a cure was effected without incontinence.

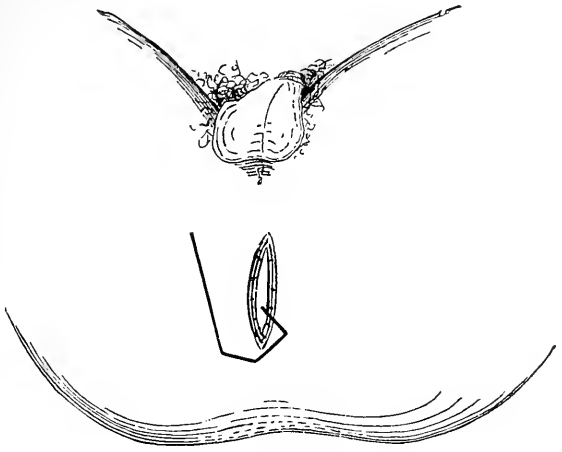

Fig. 57.

It may easily occur that in a complicated case it is found impossible to divide all of the tracks without a double or even triple division of the muscles. In such cases the safer practice is to do such an operation as has been indicated upon all the

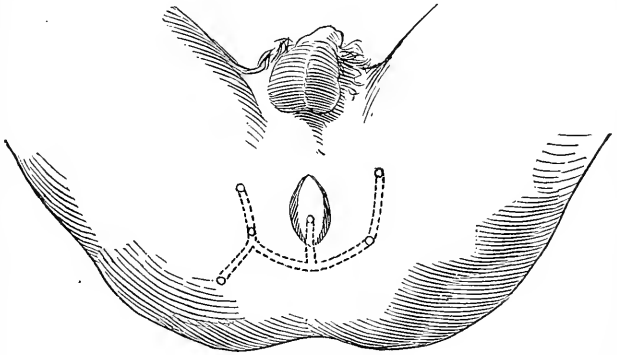

Fig. 58.—Horseshoe Fistula.

tracks that can be included in a single division of the muscle, and to trust to other means of cure for the balance, at least till the first wound has healed.

The most reliable of these other means is the injection of

strong tincture of iodine into the uncut tracks. Many of them will have been thoroughly drained by the first incisions and will

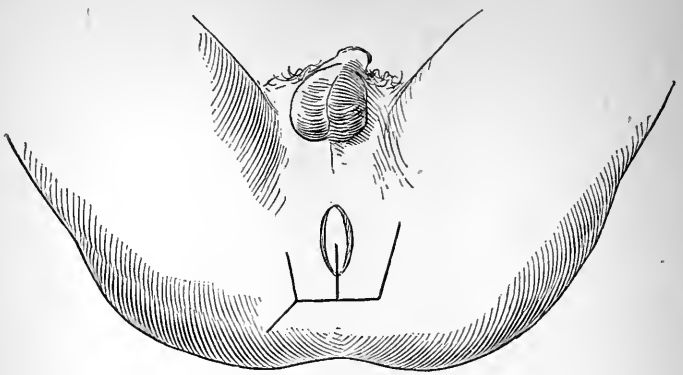

FIG. 59.—Incision for Horseshoe Fistula.

heal with the additional stimulus of this treatment. They may even be thoroughly cauterized with fused nitrate of silver at the time of the operation.

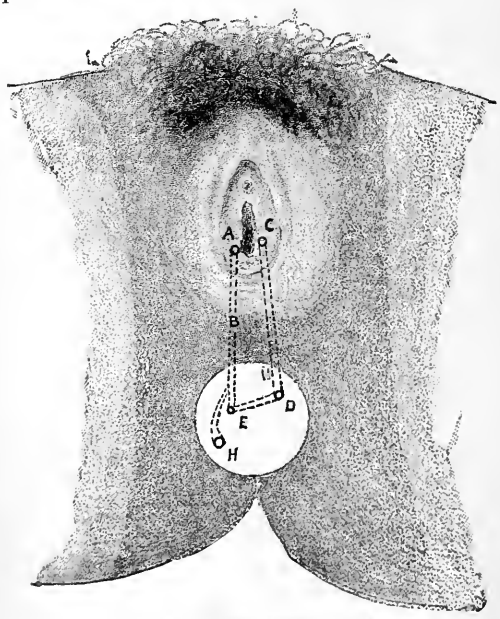

FIG. 60.—Recto-Labial Fistula.

The second class of cases in which it may be unjustifiable to divide all the tracks at the primary operation is that of the recto-labial fistulæ.

This form of disease is in most cases due to inflammation of one or both vulvo-vaginal glands or their ducts, leading to suppuration and the final escape of pus, both on the labia and within the rectum. There may be numerous external and internal openings. In the case shown in Fig. 60, recently operated upon in consultation with Dr. Kennedy, there was a labial opening on each side. The right track had opened on the anterior wall of the rectum in two places, the left in one, and the right and left tracks communicated by a submucous track in the rectum. In such a case the division of both tracks would result in a com-

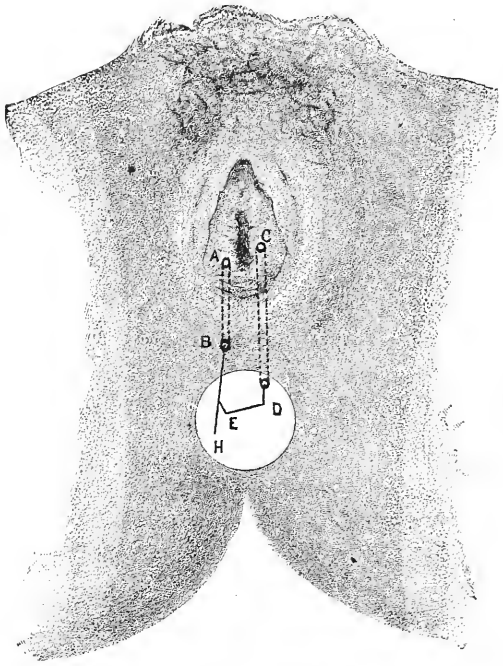

Fig. 61.—Incision for Recto-Labial Fistula.

plete double division of the whole perineum, as well as of the external sphincter.

The cuts made at the primary operation are shown in Fig. 61.

A probe was first passed through the track on the right side, from the external opening down to the verge of the anus, its end cut down upon and brought out through the skin of the perineum at the point B. From this point it was carried along the fistula to the internal opening on the same side, and this part of the track divided with the sphincter. The director was then again passed from the opening D to the first cut, and the cross-

track divided. Finally all of the submucous tracks were slit up, and the track on the left side from its internal opening as far as was possible without complete division of the sphincter at that point. Setons were then passed along what remained of the original tracks, and tied. The result was not a perfect cure in the first instance, only the rectal tracks being closed, but by the primary operation the subsequent treatment of the two straight perineal tracks was rendered much simpler.

Dr. I. E. Taylor[1] has made a careful study of this rare form of disease, and describes two different methods of operating, both, however, with the elastic ligature. The first is that recommended by Barton, in which a ligature is passed from the labial to the rectal orifice and brought out at the anus; an eyed probe is then passed from the labial orifice down along the perineum till it reaches just outside of the sphincter ani low down, its point is cut down upon, and the labial end of the ligature is drawn through this artificial opening and the ends fastened. The other operation is the same, except that the stages are reversed, the artificial opening being first made and the ligature passed from this through the rectal opening and brought out at the anus. In this way the track through the perineum is not divided, but is left to close with appropriate stimulating applications.

The only rational treatment for the blind internal form of this disease is by incision into the gut. The only exception to this is in acute cases of ischio-rectal abscess seen within a day or two after the pus has forced its way into the gut. In such, a free external incision and a thorough cleaning out of the abscess cavity may avoid the necessity for cutting into the bowel and dividing the sphincters.

Where the probe readily enters an abscess cavity or a track running downward toward the skin, it should be bent into a hook, brought as near the surface as possible, and a counter-opening made upon it. Through these two openings a director should be passed and the whole cavity laid open into the gut. In whatever direction the track leads, it must be followed to its end and freely divided. Much delicacy and patience are sometimes necessary to accomplish this so that no side tracks are missed; the probes and directors may need to be very delicate, and much time may be required; but the success of the operation depends upon the thoroughness with which it is done. Free drainage at the most dependent part of the incision should al-

[1] "Transactions New York State Medical Association," 1885.

ways be provided, and to do this it may or may not be necessary to cut deeply through the sphincters.

The treatment is simple in theory, but sometimes difficult to carry out. Large abscesses of the superior pelvi-rectal space which have opened into the rectum should be treated by the introduction of drainage tube and daily washing out with boracic acid solution. Those located in the ischio-rectal fossa should be opened on the skin, thoroughly cleaned out, and treated by drainage and injections to give the internal opening a chance to close without dividing the tissue between the two openings,

Fig. 62.

which is often considerable. Should this fail the ordinary operation may be done. In the lesser cases of small tracks without abscess cavity the track must be laid open. The rule is to enter a director at the opening into the bowel, bend it so as to follow the track, and then lay the latter open by cutting. When the track runs upward, as in Fig. 47—which, by the way, was a case due to carbolic acid, which attracted considerable attention be-

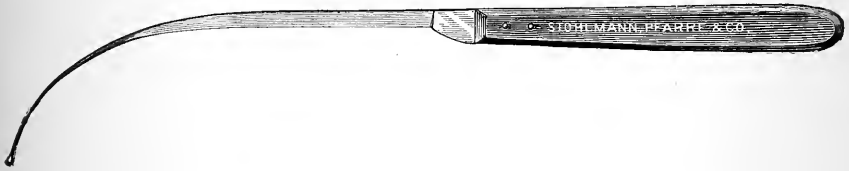

Fig. 63.—Author's Fistula Knife.

fore the cause of the patient's suffering was discovered—this is not difficult, but when it runs toward the skin, and both opening and track are small, as in Fig. 64, it is a very difficult and uncertain proceeding. Where the induration approaches near enough to the surface to be easily felt, I have in some cases cut directly down upon this through the skin without any director, and have then found no difficulty in passing a director onward through the internal opening. If, however, there is no friendly induration to guide the knife, the track must be carefully dissected out from the internal opening. It is easy under these circumstances to

make a false passage with the director, and thus lose the true one, and fail, in spite of free cutting, to cure the case.

In the case pictured in Fig. 64 I found it nearly impossible to follow the track with a bent probe, the opening being a considerable distance from the anus, but it was finally satisfactorily laid open with the curved knife shown in Fig. 62. These are operations requiring patience and care, but with the rectum well exposed, under ether, there need be no difficulty. The knife of my own invention (Fig. 63) is sometimes very useful in these cases.

In fistulæ with very long and deep tracks, or in those with many smaller ones, a cure without an amount of cutting which shall necessarily lead to incontinence may be impossible. Fig. 65 is taken from a case of the latter variety, where the openings

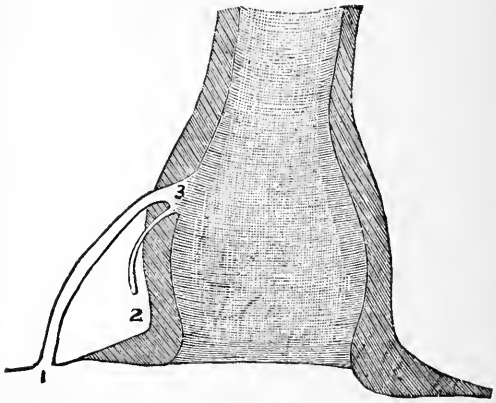

FIG. 64.—Double Fistula. 1, Original incision; 2, secondary track; 3 ulcer remaining.

and tracks were so numerous, and the patient's general condition so bad, that a cure was for some time despaired of. By several operations, however, undertaken at intervals, they were all finally laid open and cured, with the result shown.

In these cases care must be exercised not to overtax the strength of the patient by too much cutting at any one time. The tracks can often be divided into two or three main ones, each with secondary side tracks; and it is better to attack one main track and its branches at a sitting, leaving the others till the patient has gained strength by change of air and appropriate treatment.

In cases of a single but very long and deep track it may not be best to divide everything at a single sitting, as, for example, where one opening is high up in the rectum and the other in

the middle of the thigh. The question as to how much it is safe to do at one time must depend in great measure upon the strength of the patient; and it is often better to begin at the external opening and follow the fistula up to the buttock at one operation, leaving the remainder for treatment by injections or subsequent cutting.

In these deep tracks a galvano-cautery knife or wire may be better than a bistoury. A very strong knife may easily be broken in such a case as is shown in Fig. 66. The external

Fig. 65.—Cicatrices of Fistulæ

opening here was over the great trochanter, and the case was very naturally mistaken for hip-joint disease by several operators. The track had been laid open under this impression several times, but never induced to heal. It finally came under the care of Dr. H. M. Lewis, of Brooklyn, who succeeded in passing a probe into the gut, but the knife broke in the callous tissue. An *écraseur* was next used, with the strongest picture cord doubled, and this was broken. Finally the ingenious idea occurred to the operator of passing a chain saw, and by this means the cicatricial tissue was finally divided and the patient cured.

The cause of incontinence after operation for fistula has been the subject of considerable argument, for in some cases a single incision through the external sphincter has been followed by this untoward accident, while in others very extensive and numerous incisions have left the patient still with good control. Smith believes it to be due not so much to the division of the sphincters as to division of the circular muscular fibres of the lower part of the rectum; while Esmarch holds rather to the theory that it is due to division of the nerves supplying the muscle more than to the division of muscular fibres.

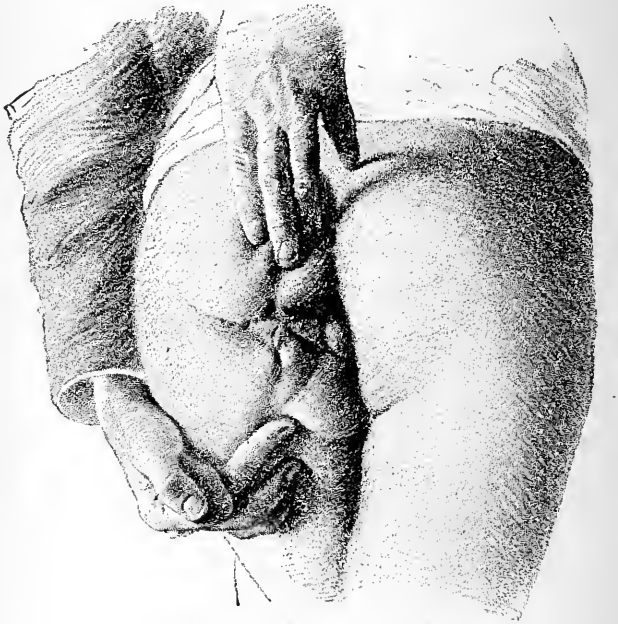

FIG. 66.—Extensive Fistula. (Lewis)

In my own mind the explanation lies in the fact of vicious cicatrization, by which the ends of the divided muscles are not brought into apposition in healing. On this supposition it is easy to understand why a single cut may result in loss of muscular power, the ends of the sphincter being separated by an interval of half an inch, and the muscle therefore having no fixed point of support; while in other cases several incisions which have healed properly may still leave the segments of the muscle in shape to act as one undivided circle. The simplest form of the same condition is seen in lacerated perineum in the female. Here a single rent is followed by almost complete incontinence;

and although the perineum may seemingly be perfectly restored by operation, there will be no return of sphincteric power till the cut and separated ends of the muscle are brought into apposition.

The condition is one which entails a greater or lesser degree of misery, depending upon the consistence of the fæces and the regularity with which they are voided. To a man who has one solid, natural evacuation before going from his house in the morning, there may be no suffering and little annoyance, except what arises from the involuntary escape of wind and the soiling of the person with the natural mucous secretion of the bowel. The fact of inability to control the passage does not necessarily imply that the passages escape in a way to cause annoyance, for

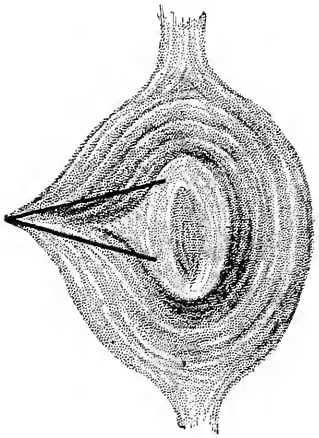

Fig. 67.

when they are of natural consistence and passed with regularity there is generally sufficient warning to allow the patient to seek the closet, which he has learned never to be far away from at a certain hour. The greatest suffering comes in women when the bowels are loose; then there is absolutely no chance to avoid the consequences; a napkin is constantly worn, and the patient soon becomes a confirmed invalid.

If the anus be open and patulous, more or less prolapsus may follow; and this is a fresh cause of tenesmus and discharge, complicating and increasing the original trouble. The train of nervous symptoms following this condition is often in itself serious, and apparently out of proportion to the physical disability.

In the treatment of this condition the operator has an ample

field for the exercise of all his ingenuity, for no two cases will be found exactly alike, and the operations must vary accordingly.

Some will be seen at a glance to be manifestly incurable, such, for example, as the one shown in Fig. 65, where the sphincters have been cut again and again in different directions till the anus has lost entirely its original shape, and it would be difficult to find any trace of the sphincter by the most careful dissection. Most cases, however, are amenable to operation and relief, and a successful operation brings much sincere gratitude to the operator.

There are two guiding principles in operating. The first is, to find the ends of the sphincter and unite them by suture; the

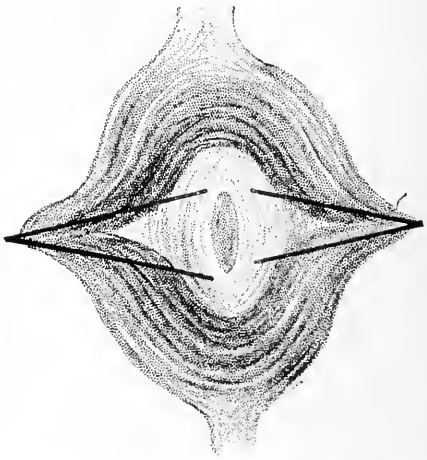

Fig. 68.

second is applicable where the first is impossible, and consists in producing an artificial tightening and closure of the anus without much regard to sphincteric action.

The first indication may often be followed out at the time of the original operation for fistula, and is, in fact, done in the operation for immediate closure of the incision by suture of the wound, under antiseptic precautions. In extensive tracks and abscess cavities the operation may fail, but in single deep cuts it often succeeds, and it is always worthy of trial with the object of obtaining direct and immediate union of the ends of the muscle and avoiding possible incontinence.

In cases such as are shown in Figs. 67 and 68, the operation is the same as in lacerated perineum—cutting down upon the

ends of the muscle, freshening the edges of the original incision, and bringing them together with wire or catgut sutures.

In a case such as is shown in Fig. 69 the operation is much more complicated. This patient, in spite of all the cutting which had been done, was still suffering from a blind internal fistula when he came under my care. In the figure the parts are not at all stretched open. The anus is seen as an irregular circle composed of cicatricial tissue, which held it wide open. The cicatrix extended an inch and a half into the rectum on all sides, and no mucous membrane was seen till beyond this point.

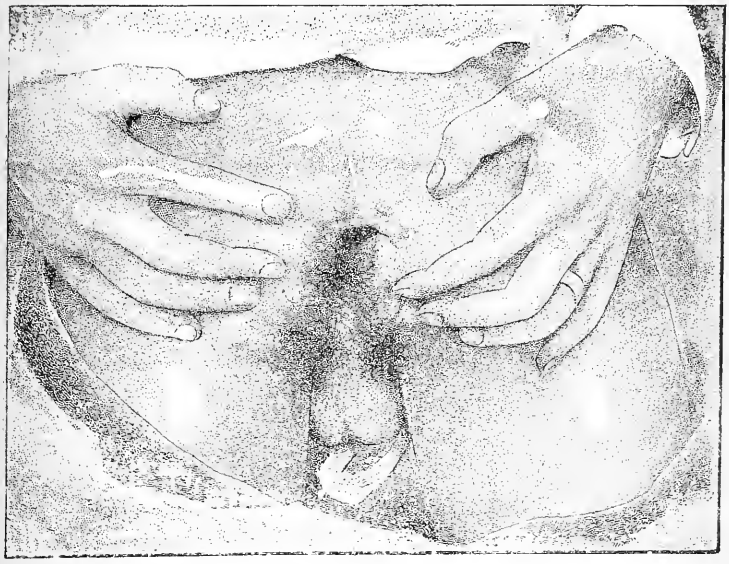

FIG. 69.—Cicatrix of Fistula.

The anus and lower part of the rectum presented an open tube about an inch in diameter, entirely without any power of muscular contraction. At the point where the folds of mucous membrane first appeared there was an opening leading into a deep sinus in the right buttock, and this was opened up, relieving the patient of the pain and purulent discharge from which he suffered.

Even in this case, with anus and lower part of rectum converted into an open, unyielding tube, the patient did not complain of incontinence, though there could have been no action of either sphincters or levator, and hence no control. He sim-

ply had a natural passage every morning and was never subject to diarrhœa.

In such a case the anus could only be closed by a plastic operation. The plan I proposed was to dissect the mucous membrane loose, draw it down, and stitch it to the skin, after freshening the cicatricial ring of the anus so as to first give a mucous lining to the parts; then, by a subsequent plastic operation, or perhaps by the cautery iron, to close the outlet of the canal. But after the fistula was cured, the patient, suffering really no inconvenience, declined further operation. The case proves better than any I have ever seen that loss of sphincteric power is not always attended by any inconvenience.

The following case will illustrate the operation of tightening the anus by the use of the cautery: The patient, a man aged twenty-seven, was originally sent to me two years ago by Dr. McCready, suffering from ischio-rectal abscess. Although this was at once operated upon, it did not stop the burrowing of pus,

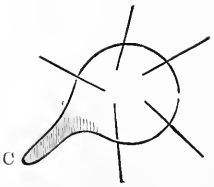

Fig. 70—Cauterizations for Incontinence.

and eventually a fistula was formed, opening into the bowel well above the internal sphincter, and out on the buttock a considerable distance from the anus. This in its turn was divided with the knife, but the result of the division of so much of the bowel and of both sphincters was a considerable degree of fæcal incontinence with all of its necessary attendant evils. Treatment of the incontinence by the passage of bougies, the use of cold, etc., resulted, after a year's continuance, in great benefit, so that the patient seldom soiled his clothing with fæces, except when the bowels were unusually loose; but there was an occasional passage of a slight amount of fæces, a frequent escape of rectal mucus, and a constant annoying sense of insecurity in the patient's mind which made him anxious for any further relief which surgery could afford. The actual cause of the open condition of the anus lay not so much in any weakening of the power of the sphincter, which always contracted firmly around the finger in the rectum, as in the peculiar shape of the anal

orifice, resulting from the contraction of the cicatrix formed by the operation for fistula. This was situated on the left side, was firm, deep, and hard, and, by its contraction, had resulted in a decided drawing of that side of the anal orifice over still more to the left, so that no amount of sphincteric contraction could close it. The condition may be seen by a glance at the diagram, in which C represents the cicatrix.

To remedy this deformity I made with a Paquelin cautery the burns represented by the radiating lines, and also removed

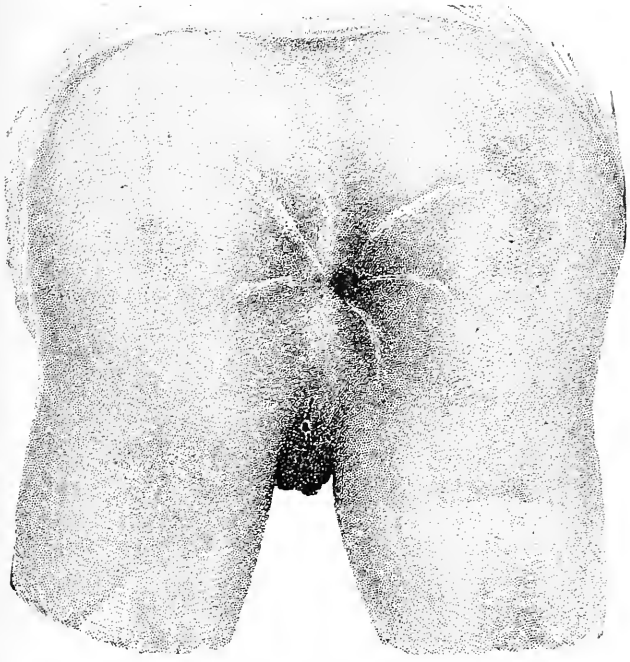

Fig. 71.—Result of Operation for Incontinence.

two longitudinal strips of mucous membrane from the inside of the bowel, clamping the tissue deeply with Smith's clamp and using the cautery freely. The burns represented by the figure were also deep, going fairly down to the sphincter, and extending from well within the anus to the distance of an inch upon the skin, growing deeper as they reached the lower end.

The operation was followed by more pain and local disturbance than I anticipated, and there was at one time a brawny hardness in the cellular tissue of the right buttock which made

me uneasy lest the patient should have another deep abscess worse than the first; but all this passed away, and after three weeks' rest in bed he was again able to attend to his work. The burns were just sufficient to produce the desired effect, and this, it is evident, is the delicate point in the operation, and the

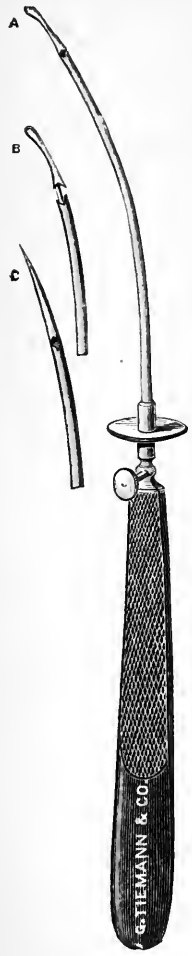

FIG. 72.—Allingham's Ligature Carrier.

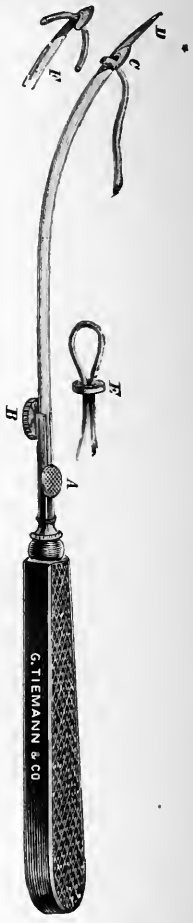

FIG. 73.—Helmuth's Ligature Carrier.

one for which no rule can be laid down, but which must be judged of by each operator in each particular case.

Fig. 71 shows the result in tightening the anus and also in drawing it to one side.

After what has been said of the origin and extent of ab-

scesses of the superior pelvi-rectal space, it is evident that there may result from them a class of fistulæ which are not to be operated upon by any of the methods we have described—fistulæ so deep and extensive as to contra-indicate all operative interference. And yet much may be done, even in the worst cases of this kind, and by proper treatment many may be cured. The first attempt of the surgeon should always be toward effecting a cure without cutting the track into the bowel. External and comparatively free incisions may be made, which shall not implicate the anus, and through them drainage tubes may be passed into the abscess cavity so that it may be freely emptied. Through the drainage tube stimulating injections may be made, and the abscess treated as an abscess elsewhere would be, by rest and attention to the general health. A cure may sometimes be effected in this way in a very unpromising case.

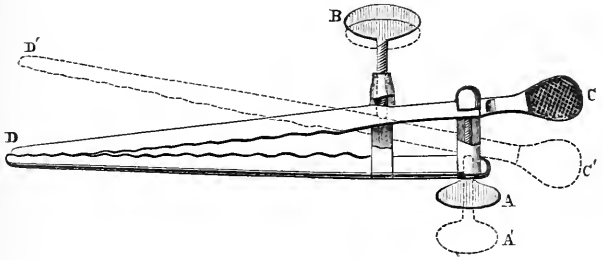

Fig. 74.—Enterotome of Richet for Deep Fistulæ.

When all these measures have been exhausted and it becomes necessary to open the sinus into the bowel, the danger of hæmorrhage may be overcome by the elastic ligature or the enterotome. Of these the former is preferable where the tissue to be cut is soft and vascular. The cord in this case is of solid rubber, which is drawn as tightly as possible—the tighter the better—and then held on the stretch by slipping a soft metal ring over the ends and squeezing its two sides together close up against the tissues. In the course of a few days the ligature will be found to have cut its way through the included tissues, the time depending on the quantity and quality of the mass to be cut.

Various devices have been recommended for facilitating the passage of the ligature. The best known is Allingham's, Fig. 72. In using it, remember that it is intended to draw the cord from the rectum out of the external orifice, and not *vice versa*. Helmuth, of New York, has modified the instrument, and I think with advantage, Fig. 73; but the least elaborate and most

effective instrument for the purpose in my own hands is a simple silver eyed probe which is threaded with the elastic cord and then passed from the external orifice through the track and out at the anus. I once had an awkward accident with Allingham's instrument, which broke in my hand in a moderately deep and hard track.

If it be deemed advisable to use the enterotome, the form shown in Fig. 74, which has been invented by Richet for this purpose, is the most convenient.

Where the track has burrowed to great length much may be accomplished by modified operations. In a track, for example, which has one opening near the anus and another in the middle of the thigh, a counter-opening may be made between the two,

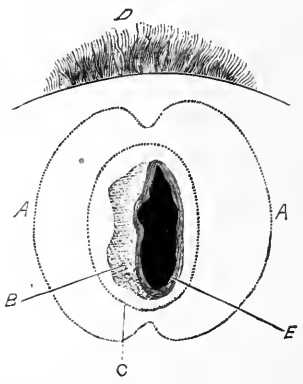

FIG. 75.—Showing the anterior wall of the rectum, and opening into it at E a sinus from the membranous and prostatic urethra. B, *cul-de-sac*, which undermined the right margin of the opening. A, A, line of incision, along which the flaps were dissected as far inward as C. For their nutrition the two lateral flaps depended upon the limit between the dotted line C and the margins of the opening E. D, the perineum. (Wyeth.)

and the further extremity induced to heal while drainage is maintained from the middle opening, by the use of injections or caustic applications. Should these means not succeed, and should it appear that a free division was likely to result in a cure, the incision may be made according to the ordinary rules of surgery. Such operations have been done, and tracks of great length extending under the gluteal muscles have been divided with the *écraseur* with good results. I have myself followed a track directly across the perineum and exposed the membranous urethra in the incision, dividing in the operation the sphincters four different times. Such operations may sometimes be necessary to save life, but they may be too great for the patient's powers of recuperation.

An abscess between the prostate gland and the perineum, where the pus is confined by the perineal fascia, may result in both a rectal and a urethral fistula. The operation in such a case is the same as for other sinuses, that leading into the rectum being first divided, and the others which communicate with it, later.

In fistula complicating stricture of the rectum, attention should always first be turned to the latter, for if this can be cured there is a prospect that the former may undergo spontaneous closure, and if the stricture be not relieved it will be of little avail to cut the fistula. Many awkward mistakes have happened to good surgeons by failing to detect this complication of diseases.

Recto-urethral Fistula.—This is generally due either to direct

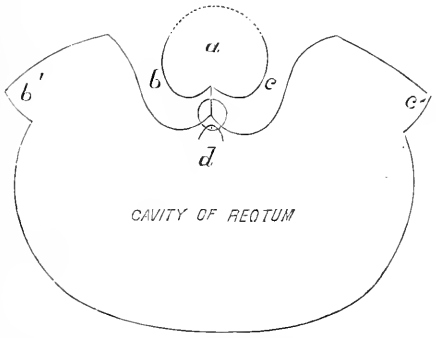

FIG 76.—Schematic. Transverse Section through the Urethra and Rectum, showing the method by which the flaps were turned from the mucous membrane of the rectum to make the floor of the urethra. *a*, Urethra; *b*, the right flap dissected from *b'*; *c*, the left flap from *c'*; *d*, the silkworm-gut suture in position (not entering the cavity of the urethra). (Wyeth.)

traumatism, surgical or otherwise, or to some ulcerative or suppurative process. Wyeth has recently reported the following case, which well illustrates the operation to be performed in such cases :

The patient, a man aged twenty-seven, had a urethro-perineal fistula resulting from an operation for stone. Four attempts had been made to close this without success. In the last of these a drainage tube about one and a half inches long was inserted in the perineal opening and left with the deep end in the urethra. This tube, about three-sixteenths of an inch in diameter, was lost sight of, and both doctor and patient supposed it had fallen out and been thrown away in the dressings. The last operation was followed by considerable persistent pain. In the course of three months an abscess opened into the rectum

through the anterior wall, and the urine began to flow freely in this new channel. About this time the perineal opening was closed and an abscess formed in each tunica vaginalis, which were incised and healed. At this date nearly all the urine passed *per rectum*, and the patient suffered so greatly that he had to be kept constantly under the influence of opium.

An examination *per rectum* revealed the presence of a stone, the end of which was on a level with the anterior surface of the rectum, about one inch beyond the anal aperture. This was removed through the rectum by means of strong forceps, and found to be a concretion around the lost drainage tube.

The patient was then etherized and placed in Sims's position, and a large Sims's vaginal speculum introduced. The opening through the anterior wall of the rectum measured three-quarters of an inch in length, with an irregular width of from one-eighth to one-quarter of an inch. It led directly into the urethra near the junction of the membranous and prostatic portions. The floor of the urethra was entirely destroyed. The right edge of the opening was slightly undermined.

It was decided to attempt the formation of a new floor to the urethra by turning the mucous membrane of the rectum into this position. Two crescentic incisions were made, about parallel with the edges of the opening, but approaching more closely at its upper and lower angles. These incisions went deeply into the wall of the rectum and included the mucous and muscular layers. The two lateral flaps were dissected up and turned towards each other, their raw edges meeting in the middle line, while the raw surfaces looked into the rectum, and the mucous surfaces into the urethra. Sutures of silkworm gut were inserted about three-sixteenths of an inch apart, so that they did not penetrate the cavity of the urethra. A Nélaton's catheter was carried from the meatus into the bladder, and through it the urine escaped at intervals. Whenever the urine accumulated enough to create a desire to expel it, about six ounces of Thiersch's solution were thrown in to dilute it, and when this with the normal contents of the bladder was evacuated the same quantity was thrown in again and immediately expelled. In this way the wound was kept free from irritation by the urine; the bowels were confined for nine days; the sutures were left *in situ*, the wound healed promptly, and the patient left for his home three weeks after the operation.

Under the heading Rectal Hernia it will be seen that as a complication of an old prolapse a fistulous communication

may sometimes be established between the small intestine and the rectum. Esmarch describes one such case, and Schroeder [1] speaks of a similar anastomosis having been formed intentionally to cure an artificial opening into the posterior vaginal *cul-de-sac*. Ball also speaks of communications between the rectum and appendix as a result of disease.

For the treatment of fæcal fistula the reader is referred to the chapter on Artificial Anus.

[1] Ziemssen's "Cyclopædia of the Practice of Medicine," vol. x., p. 531. Quoted by Ball.

CHAPTER VII.

HÆMORRHOIDS.

Although hæmorrhoids may be defined in a general way as varicosities of the anal or rectal vessels, they present themselves under so many different forms and modifications that such a definition conveys but little idea of their characteristics.

For convenience they may be divided into external and internal; and these may always be distinguished from each other, though both may exist at the same time in the same patient. An external hæmorrhoid originates in the subcutaneous veins which surround the anus; it is, therefore, entirely below the sphincter muscle, and though it may be partially covered by mucous membrane, it does not come from the rectum proper, nor can it be forced above the external sphincter muscle. An internal hæmorrhoid originates, on the other hand, within the rectum, and may exist for a long time without appearing externally. When it does show itself outside of the anus, it is a result of straining, of increase in size, or of a lax condition of the sphincter; and after long exposure outside the body it may become changed in character and appearance till the mucous membrane covering it takes on something of the character of integument; but it may still, with proper management, be returned within the bowel, though it may not remain there for any length of time.

The distinction between an external and an internal hæmorrhoid is not, however, a purely arbitrary one, the one being below and the other above the external sphincter. A different set of blood vessels is implicated in each case. An external hæmorrhoid is generally a varicosity of an external hæmorrhoidal vein, and is, therefore, an affection of the general venous circulation. An internal hæmorrhoid is a varicosity of the middle or internal hæmorrhoidal veins, which are parts of the visceral venous system. A glance at the venous anatomy of the rectum and anus (Figs. 9, 10) will show the arrangement of these two sets of veins, and will also explain how, from the

PLATE II.

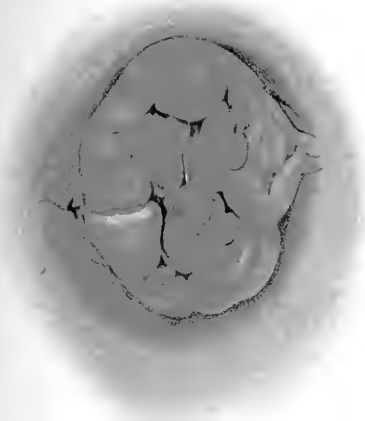

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Hæmorrhoids.

H. BENCKE, LITH. N Y.

free anastomosis which exists between them, it is improbable that one should be affected without influencing the other to a greater or less extent, and how, judged by this test alone, it may be impossible to tell whether a particular hæmorrhoid belongs to one system or the other. For practical purposes, therefore, the first definition is the better one—an external hæmorrhoid is one originating outside of the external sphincter, and an internal one is one originating within that muscle. Other secondary differences, which may arise from various causes, in the development, appearance, and characteristics of the tumors, will be considered later.

A third class of hæmorrhoids may with advantage be made to include those which are on the dividing line between the external and internal, partaking somewhat of the characters of both. (Plate II., Fig. 1.)

External Hæmorrhoids.—A person of middle age who has not at some time suffered from an external hæmorrhoid is indeed a great rarity, so common is this affection. In the majority of cases it is allowed to run its own course, and only when the pain is unusually severe, or some untoward accident has happened, does the patient consult the surgeon. It is perhaps useless to seek for the causes of a malady which is so universal, beyond a few which are well recognized and manifest. Amongst these are straining at stool, pregnancy, affections of the internal organs which interfere with the return of venous blood, and constipation. Outside of these cases where a manifest cause exists, external hæmorrhoids will be found amongst all classes. Those who smoke and those who do not; the high liver and the abstemious; the laborer and the professional man; those who stand and those who sit, are all affected about equally.

An external hæmorrhoid may appear in three different forms which bear little resemblance to each other. The first is a small, round or elongated venous tumor. (Fig. 77.)

This is simply an extravasation of venous blood into the delicate subcutaneous connective tissue of the anus. The patient, often while in perfect health, and without any appreciable cause, feels a sense of uneasiness at the anus. An examination made by himself shows a small, soft, painful lump, from the size of a pea to a grape, which disappears on pressure, but immediately returns. This is extravasated venous blood from a previously weakened and dilated vein which has ruptured. After a few hours the tumor becomes harder and more painful, and, if near enough to the surface for the blood to show under the tense skin,

it will appear as a bluish-black, circumscribed swelling. The discomfort caused by this condition is out of all proportion to its apparent magnitude. The patient generally tries to keep about, but can neither sit nor stand with any comfort. The pain is a sort of dull ache which it is very hard to bear, and to gain temporary relief efforts are generally made every little while to force the lump above the sphincter. The pressure often gives a moment's relief, but not more, for the tumor does not come from above the sphincter and cannot be made to stay there.

When left to its own course, a bloody tumor of this variety

Fig. 77.—External Venous Hæmorrhoid. (Smith.)

may gradually decrease in size from the absorption of the fluid elements of the clot, the pain decreasing at the same time: and after a week or ten days of discomfort it is changed into a cutaneous hæmorrhoid. Or the opposite course may be taken, and the tumor may show all the signs of an abscess (Plate II., Fig. 4), and finally rupture spontaneously with the discharge of a little blood and pus, and with an instantaneous ending to a week of suffering. For during this acute inflammatory process the pain is often very severe, the discomfort constant, and there is more or less febrile excitement, all of which will pass away the moment the tension is relieved.

There are two ways of treating such a tumor. The first and best is to lay it freely open and turn out the clot from its bed. The bistoury should be sharp-pointed and delicate, the tumor should be transfixed from the anal surface outward, and the incision should be in the line of the radiating folds. After such an incision the pain will almost instantly disappear. A little styptic cotton should be placed between the cut surfaces, a large towel folded into a pad applied to the part, and the patient told to sit upon a hard chair, with the compress under him, for fifteen minutes till there is no longer any oozing of blood. The subsequent treatment consists only in bathing with cold water two or three times a day, and the cut will be healed in three or four days.

If the surgeon undertake this method of treatment, there are one or two hints which may be of value. The incision itself is very painful, and should therefore be done with a sharp bistoury of the form shown in Fig. 78, and it should be done instantaneously. Whatever deliberation is required is better exercised before entering the knife. Again, care should be exercised to

Fig. 78.—Small, Sharp-pointed, Curved Bistoury.

empty the clot entirely out of its bed, otherwise a small wound remains which will not readily heal, because the sac is prevented from contracting, and the patient is obliged to wear a bandage, perhaps for a week or longer, to keep from soiling the linen with a sanious discharge. Under such circumstances, also, the pain is but little relieved by the operation. Again, I have in a few cases seen the incision heal by primary intention and the sac again fill with blood, thus leaving the patient in the same condition, as regards suffering, as before operation. This is best avoided by placing a shred of lint in the cut. These, however, are untoward accidents which may attend an insignificant operation which usually gives relief to suffering, and allows the tumor to shrivel up and disappear except for a small tag of skin which may remain and form an external pile of the second variety.

This operation is so trivial and the relief so immediate that it is generally safe to perform it without any previous explanation to the sufferer; but should it not be permitted, another plan must be followed. A cathartic containing podophyllin (pil. po-

dophyllin co.) should be given at once to secure two or three free actions of the bowels, the patient put upon his back on the bed or sofa, and a rubber ice bag filled with finely powdered ice placed against the part and kept there till the pain subsides. Cold usually gives great and immediate relief, but should it not, a poultice may be substituted. Under this plan of treatment the patient will probably be relieved in two or three days, so as to be able to get around with comfort, provided the clot is to be absorbed. In some cases, however, suppuration will occur, and in about a week from the time the swelling first appeared it will open spontaneously and discharge a few drops of pus. As soon as it becomes evident that this is to be the course of events, poultices should be applied and continued.

This form of hæmorrhoid is comparatively trivial, but it often causes great pain and confines the patient to the house for several days, and the suffering is often increased by improper attempts at treatment. Instead of being freely cut, they are often punctured with a needle by the patient. The result is the escape of a few drops of bloody serum, relief for an hour or more, and then renewed suffering from the bruising and squeezing which usually attend this attempt at surgery. I have seen them leeched by physicians, with the result of starting a slight bleeding which continued for several days, without, however, giving any relief. They are not infrequently injected with carbolic acid by those who have heard of this method of treating hæmorrhoids, and it is only by great good luck that suppuration can be avoided after this has been done.

Those who have once been troubled with this form of hæmorrhoids are very liable to repeated attacks. The veins are delicate and feebly supported, and a little unusual strain upon them is sufficient to produce an extravasation. This may happen after a constipated passage, an interference with the perfect discharge of the hepatic functions, or from a cause too slight to attract the notice of the patient. The preventive treatment of this, and in fact of all other varieties, consists in the maintenance of as perfect a state of the general health as possible, perfect regularity in the action of the bowels, without straining, and the daily use of cold-water ablutions to the parts. Tobacco and alcohol must both be used in moderation, if at all, over-eating must be avoided, and if a careful regulation of the diet will not suffice to produce a regular, daily, natural action of the bowels, a slight laxative must be taken daily. One who is in the habit of having a passage each morning may easily bring

on an acute "attack of piles" in a few hours by going to business without taking time to attend to this function, and may be able to relieve it by an enema or a glass of mineral water almost as quickly.

All patients with any tendency toward hæmorrhoids should use cold water to the parts freely, at least once a day. In the morning before dressing, after the daily movement, or at night before retiring, it is well to sit on the edge of the bath tub, turn on the cold water, and with a large sponge apply it freely. The parts should not be rubbed either with the sponge or in drying with the towel; but the sponge full of water should be placed against the parts, and gently pressed out fifteen or twenty times. This is the best tonic, astringent, and anodyne of which I have any knowledge, and its habitual use would prevent a very considerable portion of all hæmorrhoidal difficulties.

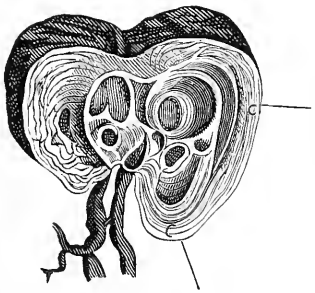

Fig. 79.—External Hæmorrhoid after Injection of the Vein. (Froriep.)

The second variety of external hæmorrhoid is a tumor composed of enlarged and varicose veins at the verge of the anus, and is shown in Fig. 79. Here there is no extravasation of blood, but a simple dilatation of the vessels, with perhaps a slight increase in the amount of connective tissue. The tumor is therefore of gradual and not of sudden formation. Its development goes on with so little suffering that the patient is often conscious of it only by the gradual increase in the size of the tumor. During and after the act of defecation the veins are turgescent from straining, and the tumors swell up so that they are very prominent and cause more or less uneasiness for a short time; but with the re-establishment of the circulation these symptoms disappear. In examining such a patient, the verge of the anus may at first sight seem normal, but when the patient strains the venous tumors at once become prominent, and individual veins, greatly enlarged and full of blood, may be

seen through the skin. These tumors are not circumscribed, as are the last, and it is difficult to mark out their boundaries. They are generally multiple.

I have been called upon to treat this condition, existing without other disease, oftener, perhaps, in physicians and in very nervous patients than in any other class; though it is not infrequently united with other hæmorrhoidal tumors for which any patient may seek advice. As a rule, I think, when there is no other trouble, it is better to treat it by cold applications and regulation of the bowels, as already described, than by a surgical operation. If, however, the patient be under ether for a more severe operation, it is generally easy to include enough of these tumors in the clamp or ligature to cure them at the same time. As there is no distinct mass to be removed, I never advise a cutting operation for these alone, and thus far have confined myself to one of two methods—the injection of carbolic acid and electrolysis. There seems to be little to choose between them; and yet, if preference is to be accorded to either, it is probably to the latter, on the ground that it is not likely to produce a slough.

If carbolic-acid injections be used, the strength of the solution should not exceed ten per cent of the pure acid. This will generally cause a smarting sensation for a few moments, and no further trouble, while a thirty-three or fifty per cent solution thrown into one of these veins, showing as a black line under the skin, will cause it to immediately change to a whitish hue, and a few days later the patient will appear with an ulcer of considerable size, which will take some weeks to heal. The idea is to produce induration without sloughing, and to be sure of doing this the injection must be weak and repeated several times at intervals.

I cannot overcome the idea in my own mind that there must be danger of embolism in thus injecting carbolic acid into an enlarged vein through which the blood is freely circulating, and on this account I have abandoned the practice, though without (fortunately) any clinical data upon which to support the idea. I now much prefer, with the patient under ether, to gently apply the point of the Paquelin cautery, heated to a dull red, to each of the swollen veins.

Electrolysis is not generally very painful in its application, nor is the subsequent suffering very severe.

In the use of electrolysis a current should be secured sufficient to cause coagulation in the white of an egg in a glass.

The positive electrode should be a fine cambric needle, introduced into the centre of the tumor. A sponge over the buttock or sacrum answers for the negative. Cocaine may first be injected into the tumor with advantage, and the positive needle should be introduced and separated from surrounding parts before the negative is applied. The current should be passed for at least ten minutes, and after a short time the cautery action at the point where the needle pierces the tumor will be plainly visible. There will be some pain at the time of the operation, and perhaps considerable on the following day, but after this the tumor will be found considerably reduced in size.

In the third form of external hæmorrhoids the vascular ele-

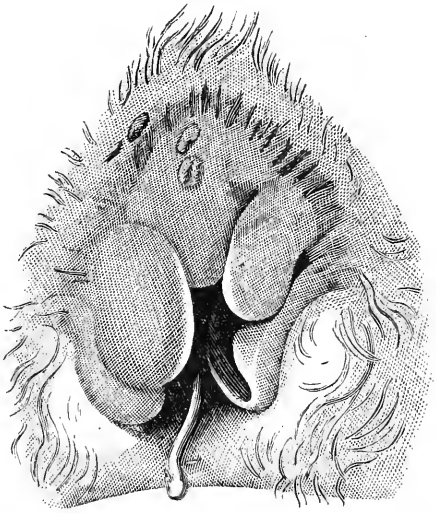

Fig. 80.—External Cutaneous Hæmorrhoids. (Esmarch.)

ment is insignificant as compared with the great increase in connective tissue which occurs. This tumor seems at first sight to be only skin and connective tissue, and is often improperly spoken of as a condyloma, though we shall reserve that term for an entirely different condition. It is shown in Fig. 80.

Such a tumor may result directly from either of the other two varieties, or it may gradually form as the result of the irritation of more serious disease within the rectum; under the latter circumstances being generally due to the contact of irritating discharges with the skin. When the first variety has undergone acute inflammation, as it often does, a tumor of this kind is the natural result; for resolution is almost never com-

plete. The venous tumor becomes harder and larger, the skin over it firmer, it loses its vascular character and becomes a connective-tissue tag such as is shown in Fig. 81.

These connective-tissue growths may be single or multiple, and vary in size from a pea to a tumor the size of the thumb. The anus may be so completely hidden among them as scarcely to be discernible. They may be pendulous or attached by a broad base partially encircling the anus. They are often excoriated on the mucous aspect, and thus give rise to an annoying and offensive discharge. At the base of one of them a fissure will often be found, and it has sometimes seemed evident to me that the latter was directly due to the violence resulting from the weight and dragging of the former.

The origin of these tumors should be well understood. When found at the anus in connection with a stricture of the rectum, they are supposed to indicate syphilis as the cause of the stric-

FIG. 81.—External Hæmorrhoid with Increase of Connective Tissue. (Esmarch)

ture. I have no faith in such a statement. To me they indicate nothing but a continued irritation of the outlet of the rectum. They are, according to my experience, as frequent in cancerous as in syphilitic stricture, and often as well developed when there is no serious rectal disease.

It is safe to say that the surgeon will seldom be consulted for these tumors alone when they are quiescent—that is, when they are not acutely inflamed and therefore cause no pain. But they are liable to become inflamed on very slight provocation. The same causes which will produce the last variety will cause acute inflammation and suppuration in this. Then the patient presents himself with much the same symptoms as in the last case, except that the pain has been more protracted, because the patient is more accustomed to the annoyance of the tumors and is slower to seek relief. The patient will come with the history that he has had piles for a long time, that they never go back, that generally they cause little annoyance, but for a week back he has had great pain, there has been considerable swelling, and

he is unable to sit down with any comfort. An examination will reveal a hard, tender, somewhat œdematous mass of tissue just at the verge of the anus. Its attached base may surround nearly one-third of the anus and may be fully half an inch thick. It cannot be forced above the sphincter, or, at least, cannot be made to remain there. There may be two or three of these tumors. The outer surface is composed of skin, and the inner is smooth and shining, being composed in part of finer skin and in part of the mucous membrane in which the skin ends at the anus. It is plainly a connective-tissue tumor, having its attachment outside of the rectum, and not one composed of blood vessels covered by the mucous membrane of the rectum.

It is necessary to be thus particular in the description of this form of hæmorrhoid because of the painful errors often seen in its treatment. It never, when uninflamed, belonged within the canal, and it naturally cannot be made to stay there by any amount of force when it is swollen to three times its usual size. It is not a vascular tumor to any extent, and therefore the leeching and scarifications often resorted to never give any relief, while the force used at attempted reductions, sometimes under ether, invariably makes matters worse. If allowed to take its own course it will seldom suppurate, but will gradually subside, and in a couple of weeks the pain will in great measure have disappeared, the tumor always, however, remaining somewhat larger than before the attack.

The treatment of this variety is essentially the same as in the last, although the cutting to be done is more considerable. It is particularly in this class of cases that cocaine may be used to the best advantage. If the base of the tumor be small, five drops of a four-per-cent solution should be injected into it, and when it is no longer sensitive it may be seized with forceps and snipped off with strong scissors. There will be some bleeding, but generally only a little, and styptic cotton, with a compress and bandage, left on for a quarter of an hour will stop it. When the base is larger, say an inch or more in length, cocaine must be used at two or three points, and I prefer the clamp and cautery to the scissors. No after-dressing will then be necessary except cold water, or possibly a poultice to relieve pain. If the tumor be small, the patient will generally be free from pain and able to attend to his business on the following day. If it be larger and the clamp has been used, it is better to keep him in bed for several days, with cold compresses or poultices to the wounds.

These operations are best performed when the tumors are

quiescent and not acutely inflamed, as the pain will then be much less and the recovery much more speedy. But, unfortunately for the patient, he seldom wants anything done till he has had a good deal of suffering, and the doctor is seldom consulted except during an attack of inflammation. Under such circumstances nothing is gained by waiting for the attack to subside, although the operator must allow for the infiltrated condition of the parts, and not remove enough skin to cause subsequent stricture.

One of the most extensive cases of this form of trouble I have ever seen is shown in Fig. 82. The patient was under the care of Dr. Hemingway, of New York, with whom I operated in consultation. The man had had hæmorrhoids for years. About

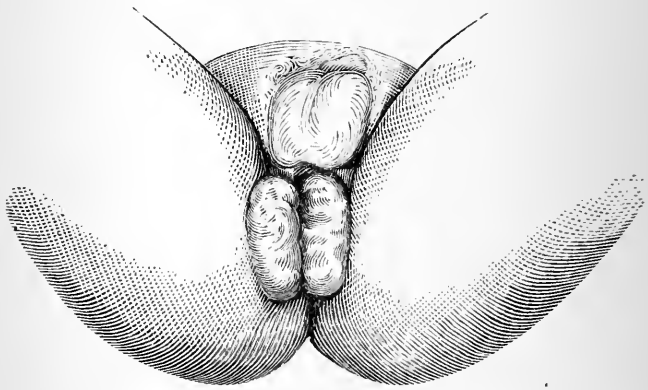

FIG. 82.

a week before I saw him he had been drinking hard and had ended his spree with a heavy dose of cathartic pills. On waking in the morning he found his piles much worse than before and entirely irreducible. On examination two hard, œdematous, intensely painful masses were found, forming a complete ridge around the anus, each about the size and shape of the thumb, and meeting in front and behind. They were covered externally by skin, and internally by the smooth, glistening mucous membrane of the verge of the anus. The finger introduced between them passed readily into the healthy rectum, but there was no sphincteric contraction appreciable.

On account of the extent of the disease the patient was treated for four days with absolute rest in bed, poultices, and anodyne applications, but without causing any decrease in the size of the tumors. He was then etherized and the masses re-

moved with the clamp and cautery. On account of their size, which was too great to permit of grasping the entire base in the clamp, each one was divided at the middle down to the margin of the anus, and clamped off in two sections—the cautery thus being used four times. After this the anus itself was burned through posteriorly and on each side, to cause future contraction of the orifice; for, from the very dilated state of the anus and loss of power in the sphincter, there was reason to fear future prolapse after the hæmorrhoids were cured. The patient made a good recovery, with a tight sphincter.

I mention this case as an illustration of the proper method of treatment, though the condition was much more serious than will often be seen.

Supposing now that the patient declines operation, the case must be treated as follows: Absolute rest in bed, laxatives daily to keep the bowels free, an ointment of equal parts of extract of opium and extract of belladonna, with sufficient vaseline to render it soft, kept constantly and freely smeared over the parts, and hot poultices constantly applied. By this means the inflammation will gradually subside, and in an ordinary case the patient will be around in a week or ten days. There is nothing else to be done. Attempts at reduction always do harm and can by no possibility do good, and the same applies to leeching, scarification, and incision. Injections of carbolic acid will cause suppuration, and, failing this, can only make the patient's condition more unendurable. Should suppuration occur the result will very likely be a subcutaneous fistula.

Internal Hæmorrhoids. — External hæmorrhoids were described as varicosities of the external hæmorrhoidal veins; and internal hæmorrhoids may also be similarly defined as varicosities of the middle and superior hæmorrhoidal veins, but they are more than this.

In describing these tumors it is only necessary to make two classes, the capillary and the venous. The capillary hæmorrhoid is in reality an erectile tumor, composed of the terminal branches of the arteries and veins and of the capillaries which join them. This form of tumor is never of large size, and never projects very far into the cavity of the rectum. To the naked eye and under the microscope they strongly resemble an arterial nævus. They may be situated high up in the rectum or low down by the sphincter; their surface is granular, and the membrane covering them is always of extreme thinness. This accounts for the chief symptom which distinguishes them clini-

cally from the other varieties—the free hæmorrhage which follows the slightest bruising of their surface, even in the act of defecation. Such a tumor never appears outside of the anus unless accompanied by some other rectal affection, but it may sometimes be seen by a careful pulling open of the sphincter with the fingers, and from some part of its strawberry-like surface there is pretty sure to be a jet of blood, coming *per saltum*. The disturbance caused by the gentlest examination is sufficient to start this bleeding, and it almost always occurs at defecation. This is the form of hæmorrhoid to which the name of "bleeding" most properly applies. In my own experience it is not as frequently met with as the varieties to be described later; and this probably for the reason that after existing for a longer or shorter period in this form it is changed into one of the others, and that patients do not seek relief till after such change has occurred. After a time the mucous membrane covering such a tumor becomes thickened, and as a result of repeated irritation there is an increase in the submucous tissue. The hæmorrhage decreases in frequency and finally ceases as the capillaries become obliterated by the increase in the connective tissue, and the capillary tumor is succeeded by the venous one.

The one symptom of a capillary hæmorrhoid is the daily hæmorrhage; and as this hæmorrhage occurs at the time of defecation, and there is no pain at any time, the patient may be entirely ignorant of the fact that blood is daily lost. This is particularly the case with the class of patients seen in public practice who give little attention to themselves. In the higher walks of life such a loss of blood seldom occurs without the knowledge of the patient; but unfortunately it is often disregarded, especially in women, who are in the habit of losing blood at every menstrual turn and who always shrink from an examination.

It is not necessary to relate in detail the train of constitutional symptoms which may follow the daily loss of a considerable quantity of blood. The anæmic look, the disturbance of the heart's action, the troubles with the digestive apparatus and with the sexual organs, the cessation of menstruation, are all well known. But it is curious that, as in a recent case in my own practice, a very intelligent medical man, who understood perfectly his own condition, should allow himself to be brought to a state of profound anæmia by a little hæmorrhoid of this variety rather than have anything done for himself. In this

case a single application of nitric acid to the bleeding surface worked a permanent cure.

The following case, seen by me with Dr. Watson, of Jersey City, will illustrate this form of disease and the appropriate treatment:

The patient, a lady thirty-five years of age, had been married fifteen years, and ever since marriage had been troubled with occasional profuse rectal bleeding. As much as half a pint of arterial blood is said to have passed at a time. There had never been any protrusion, and the blood was passed, not with the stool, but some time after by itself. Frequent rectal examinations by the finger had failed to detect anything abnormal, and arrangements had been made for complete dilatation and examination under ether. Before doing this the usual inspection of the parts was made by gently pulling down and opening out the folds of the anus, and just within it was detected the bright-red, slightly raised mass of blood vessels, which, to my mind, was sufficient explanation of the history. Without making a complete examination of the whole rectum, it was decided first to cure this, and two thorough applications of strong nitric acid, Dr. Watson tells me, entirely stopped the hæmorrhage.

This is the only form of hæmorrhoid in which applications of nitric acid will be likely to result in permanent cure, and in this it works so well that it is hardly worth while to try other things. If the application be made thoroughly to the whole surface, a single one will be all that is necessary, in most cases, to entirely cure the disease.

The only other cases in which I use nitric acid are those of well-marked internal hæmorrhoids which bleed freely at stool when protruded, and in which for any reason—such, for example, as pregnancy—it is inadvisable to attempt a radical cure. By touching the surface of these tumors with strong acid the bleeding may cease entirely for a considerable time, and the tumors may even diminish in size.

The Venous Hæmorrhoid.—In this form of tumor the capillary network has disappeared and in its place is found a mass of freely anastomosing veins bound together by connective tissue. The veins are tortuous, often varicose and dilated into sacs and pouches; and there may be one or more arteries of large size, especially the one which enters at the base of the tumor, the pulsations of which may often be distinctly felt by the finger. Such a tumor is often of considerable size; it is

firm to the touch and smooth; it is liable to inflammation, erosion, hæmorrhage, and prolapse. The hæmorrhage which occurs is arterial in character and apt to be abundant.

The classification of hæmorrhoids into capillary, arterial, and venous, which is due to Allingham, has not stood the test of observation. Cripps, in his work on the rectum, says: "The fact of blood escaping in jets has led some high authorities to regard it as arising from some arterial twig. With due deference to such eminent authorities, I am of the opinion that they are mistaken, and do not believe that the blood ever comes from the arteries, but that the jet is due to its being forced as a regurgitant stream through a minute orifice in a vein by the powerful pressure of the abdominal muscles."

He reiterates this opinion, holding that the fact that the blood escapes only when the abdominal muscles act and the veins are subject to pressure shows that its source must be venous. If it were arterial, the effect of straining and pressure would be to diminish rather than promote the spurting. Apart from this evidence, he has more than once detected the actual opening in the vein from which the stream escaped. In one case, that of a woman reduced almost to death's door by hæmorrhage recurring for many months when at stool, he observed on the summit of one of the piles a little adherent clot of blood. On removing this it was found to be blocking up a minute circular opening in the wall of a dilated vein, into the interior of which a fine probe could be easily passed.

In another case in which the jetting was a prominent symptom, he discovered an exactly similar opening after wiping away a projecting clot. On telling the patient to strain down, a minute jet was immediately expelled a distance of several inches.

He believes there is no evidence, either from life or *post-mortem* examination, to show that a pile ever consists of varicose arteries, and in this I agree with him. Nevertheless Allingham's classification is not without value, inasmuch as it calls attention to the fact that in some varieties of internal hæmorrhoids there is a larger proportion of arteries than in others.

Symptoms.—The two main signs of internal hæmorrhoids are protrusion and bleeding, but there are many symptoms less diagnostic than these, but of fully equal importance. For example, there is a peculiar train of nervous effects which is quite characteristic of the disease, and which may be well marked before either bleeding or protrusion has appeared. These are, a feeling of discomfort in the rectum and a sensation that it has

not been thoroughly emptied after stool, which induces the patient to sit and strain for a long time; difficulty in micturition, diminished sexual power and desire, pain in the genitals, loins, and thighs, and formication in the lower extremities. A very marked case of this last symptom was sent to me by Dr. Spitzka. The patient was himself a very intelligent physician, who had consulted Dr. Spitzka for supposed incipient locomotor ataxia; but no disease of the spine being found, he was referred to me for rectal examination, under the suspicion that a disease of this part might account for the condition. Such was found to be the fact, there being well-marked hæmorrhoidal trouble which had never manifested itself in any direct way, except by a slight uneasiness after defecation.

Pain in the rectum of a sharp, lancinating character may be present as an early symptom, but it is not generally complained of until the tumor begins to descend within the grasp of the sphincter and appears at the anus at each act of defecation. If the sphincter be firm and strong, it is then apt to be very severe and the tumor may become strangulated; but after the disease has existed for any great length of time, and especially in persons past middle life, there is apt to be a loss of power in the muscle which, though it facilitates prolapse, decreases the pain attendant upon it.

The study of rectal reflexes is a very interesting one, and one into which I hope some time to have the opportunity of entering more fully. In connection with hæmorrhoids I have seen some remarkable nervous phenomena. I had a patient not long ago—a muscular young man—who was nearly overcome at each act of defecation by faintness. There was no pain, his piles were of moderate size and easily reducible, but every time they came down he very nearly lost consciousness.

Another symptom of rectal disease which I have never been able to understand is what I have often termed rectophobia—the sense of impending evil which is so common in rectal troubles. There is hardly any variety of pain or of functional nervous disease that I have not cured by the simple removal of hæmorrhoids, and this applies as often to men as to women.

It will occasionally happen that internal hæmorrhoids, though fully developed and of many years' standing, have never been known by the patient to cause any loss of blood, though such a case is very rare.

In ordinary cases the patient will reduce the tumors when they come down on defecation. They may, however, become

strangulated and be entirely beyond the patient's power of manipulation. In such a case, after a period of rest, and after the relief which may follow a spontaneous escape of blood from the over-distended vessels, the hæmorrhoids may return of themselves or be put back by the patient.

If the strangulation be more intense, gangrene may set in and a part of the mass may slough, or a part may suppurate and pus be discharged. Under these circumstances there will be great pain and more or less constitutional disturbance, with fever and loss of appetite. The gangrene is very evident to the eye from the greenish or blackish color and fœtid odor of the part, and is rather a favorable termination to the trouble, as it generally results in a radical cure.

Diagnosis.—It is not always an easy matter to discover an internal hæmorrhoid, even though it be far enough advanced to cause hæmorrhage and more or less uneasiness. When it has become hard it may be detected by the accustomed finger in a simple digital examination, but when soft and not over-distended it may escape detection. An examination should be made directly after the rectum has been emptied by an enema of warm water, when the water and the straining have brought it into prominence, and should be made with a speculum when there is any doubt. Under these circumstances it may generally be brought plainly into view. An examination in a case of internal hæmorrhoids should never end at the finding of the tumor. An inch or so higher up there may be a stricture, malignant or simple, which has given no sign of its presence except the hæmorrhoids, and this is not a good thing to overlook.

It is not safe to say that a patient may not be suffering from internal hæmorrhoids simply because he denies either protrusion at stool or bleeding, for hæmorrhoids may cause many other symptoms even when these two are absent. Perhaps one of the finest points in digital examination is to detect internal hæmorrhoids by touch alone. I had been a rectal specialist many years before my finger became trained to this point.

The existence of hæmorrhoids in children has been denied by excellent observers of large experience. Gosselin does not admit the existence of the internal variety, and says plainly that he will believe in external hæmorrhoids in children when he has seen them, or when a good observer, after a thorough examination, will say he has seen them. On the other hand, Tranka, writing in 1794, speaks of thirty-nine cases in children under fifteen, eighteen of them being under five, and five under one year

of age. Unfortunately, at that time, bleeding from the rectum and hæmorrhoids were nearly synonymous, and the differential diagnosis of these affections was hardly accurate enough to allow us to judge exactly of the value of this statement. It may be safely stated that internal and bleeding hæmorrhoids in young children are exceedingly rare. Of the external variety I have seen one perfectly clear case in a child of three years, the son of a physician. The tumor was of the external venous variety, contained a large, dilated venous pouch in which the black blood could be distinctly seen, and was about the size of an ordinary grape. It was caused by the straining to urinate, due to a congenital phimosis, and disappeared spontaneously with the removal of the cause.

Treatment.—Before recommending anything in the way of a surgical operation, the surgeon must consider whether the case before him is one in which such a procedure is justifiable; and this brings us to the consideration of what have been called symptomatic hæmorrhoids, as distinguished from those which are apparently idiopathic.

Internal hæmorrhoids may be symptomatic of disease in a number of the viscera. They often indicate structural changes in the wall of the rectum at a higher point, such as malignant and non-malignant stricture; and, under such circumstances, whatever is done in the way of relief must be done to the stricture and not to the hæmorrhoids. Again, they are often secondary to disease of the bladder, to enlarged prostate, or to stricture of the urethra, and in these cases where it is possible to remove the cause it must always be done. If hæmorrhoids are dependent upon a calculus or a stricture of the urethra, they will probably disappear when these affections are cured. A man with enlarged prostate is never a very desirable subject for a surgical operation, and if such a man's hæmorrhoids can be rendered endurable by the palliative treatment already described, the better way will be not to use the knife.

In women hæmorrhoids often depend upon disease of the uterus, and in every female patient this dependence should be carefully inquired into, and, if found, removed before operation. It occasionally happens that a pregnant woman will suffer so severely from this complication as to demand surgical aid. Though it is better not to operate until some weeks after delivery, except in a case where the hæmorrhage or the pain renders it unavoidable, still pregnancy is not an absolute barrier to surgical interference in this more than in many other affections.

Hæmorrhoids may also be symptomatic of disease of the liver, kidney, heart, or lungs. There are few liver affections which need prevent operative interference in a bad case, but such interference should be preceded by general treatment pointing toward relief of the hepatic circulation. An excess of alcohol in the daily diet should be stopped, and a blue pill may be given with advantage every other day for a week before the operation. Affections of the lungs, except in a very advanced stage, need not prevent an operation. The condition which most positively stays the hand of the operator is that of albuminuria, whether dependent upon heart or kidney.

Before undertaking the treatment of a case of hæmorrhoids, both patient and surgeon should come to a distinct understanding. The latter can assure the sufferer that he may be cured at once and forever if he desires, and this applies to all forms of the disease. The only cases in which this cannot be said are those in which the patient is in such bad general condition that no interference is justifiable. If he be suffering from advanced disease of heart or kidneys, for example, and at the same time be troubled with old hæmorrhoids, it may be safer to do what can be done by palliative measures, and avoid anything like radical treatment. This is the only thing that should prevent the surgeon from attempting a positive cure. Ordinary disease of the lungs has never prevented me from operating and getting a good result.

Just at this point the surgeon will have many questions to answer, and one of the most common is whether nature did not intend that a great many people should have a painful affection of the rectum which should make a part of their lives miserable and cause them to lose two or three ounces of blood every time they go to the closet, and whether it is safe for the sufferer to have this beautiful condition interfered with. This question will come from very intelligent people, who will back it up with the authority of some physician that by suffering in this way they are escaping something worse. Should the same physician who advises that this daily bleeding be allowed to continue make a practice of opening a vein in his patient's arm once a day for years, and withdrawing the same amount of blood, what would be thought of his practice? And yet one would be as good practice as the other.

The next question will be whether the patient can be cured without an operation, and at exactly this point many a patient will disappear. The answer will depend, as will be shown

presently, upon the form of trouble present. Many cases can be cured without an operation, and many more by procedures so trivial that they carry no terror in the thought; but some cannot. In the latter class of cases the young practitioner must not, for his own sake, allow himself to be placed at a disadvantage which is pretty sure to end disastrously.

Unfortunately for the public, they almost all consider themselves pretty well educated on the subject of piles. Cures "without knife, ligature, or caustic" have caught their eyes in the daily press for years, and they come to their doctor, not to be guided by his judgment, but to have him relieve them, if he can do so, subject to the restrictions they may impose. The conditions are these: "If you can cure me without an operation I am willing to be cured, otherwise I prefer to be let alone." There is no blame to the patient in this, for he has a perfect right to make his own bed and lie in it; and it may be possible for the physician to do as he desires and cure him without ether, without confining him to his bed, and without any "operation," as he considers an operation. But the young surgeon must not be too anxious for the case. He may be forced to say, "What you desire is impossible," and let his patient go; but he never must be led into a line of practice which is not safe, for when trouble comes no mercy will be shown him. The patient is practically doctoring himself, with a physician to assist him, and in his heart he knows it. The case goes badly, and the doctor has all the blame and deserves it. The rule in my own practice is, I believe, the only one to be followed. After my examination I recommend the method of cure which seems to me the best, and from that I never allow myself to be shaken. If it seems to the physician that the clamp should be used, he must in honesty use it, and not allow himself to be placed by his patient in the false and untenable position of recommending one treatment as best and then employing another. To be sure, he will occasionally see his patient go elsewhere, but less often than he fears; and, on the other hand, he will avoid bad surgery with its unpleasant consequences. He must make up his mind at first that a great many patients had rather suffer all their lives than be cured by any operation, even as safe and painless as this; and he may strive to find some method of curing, or at least relieving this class, which is free from the terror of a cutting operation; but he will probably discover in his search that hæmorrhoids are bad things to experiment upon, and his first accident will greatly dampen his ardor, in the light of the fact

that he already has at his hand a means of cure which surgically leaves little to be desired. On this point let me say that the profession in general, the great body of practitioners scattered over the country, have been unduly worried about a particular method of curing hæmorrhoids by injections. The secret remedy is known; it has been faithfully tried in hospital and private practice by representative men both in Europe and America; it will be fully described in the course of this chapter, and its advantages and disadvantages compared with other recognized means of treatment. I also venture to predict that as a popular quack remedy it has seen its best days; for the reaction in the public mind has already begun, and where a year or so ago every patient was determined to have nothing but carbolic acid, they now not infrequently are just as anxious to have nothing to do with it.

If the surgeon wishes to try this method of treatment, at the demand of the patient, he is justified in doing so; but it is not equally adapted to all cases, and in some respects its action is very uncertain, as will be shown later.

Some patients will deliberately choose a course of palliative treatment, even knowing that it is not curative, rather than be cured by surgical means. For such the practitioner must be prepared to furnish what relief he can, and this is often very great.

In my own practice ointments and suppositories have very little place in treating internal hæmorrhoids, and rectal supporters have none at all. The line of treatment has already been alluded to. Perfect daily regularity in the movement of the bowels, and the free use of cold-water applications, are worthy of the greatest reliance. The latter will be found a much more effective astringent than either tannin or iron.

It is sometimes necessary to treat a patient with internal hæmorrhoids for the complication of strangulation when he is unwilling to submit to anything looking toward radical cure. His piles, owing to some accident, some nervous strain or irregularity in living, are down, have been down a day or two, and no manipulation on his part will put them back. Examination shows them to be exquisitely sensitive, engorged, and possibly even gangrenous, and the sphincter grasps them with a power which cannot be overcome. This extremity may be the doctor's opportunity, and many a patient is willing to be radically cured, after forty-eight hours of such suffering, who has always been too timid before. Under such circumstances nothing is to be

feared from an operation, and nothing to be gained by delay. The patient should be etherized and the tumors removed with the clamp and cautery. The cure will be as rapid as under ordinary circumstances. Should, however, the patient still object to radical treatment, the following is the best course of procedure: Place him on his face, with a hard pillow under the pelvis, smear the whole mass and the right hand freely with olive oil, cover the tumors completely with the fingers, and make gentle and firm pressure on the whole mass at once till a part of it slips up the bowel. If a single tumor will give place the others will soon follow.

This is not a matter of half an hour, but of one minute. If it does not succeed at the first attempt it probably will not at all; and the next step is to give ether to the point of primary anæsthesia and forcibly reduce the mass. With ether internal hæmorrhoids can always be reduced when strangulated by a tight sphincter. Should the patient object to this, there is nothing to do but leave him in bed, with ice to the parts and the ointment of opium and belladonna freely applied. The tumors may slough at one or two points even without the ice, and the ice must not be pushed too far on this account; but sloughing under these circumstances is one of nature's means toward a partial cure. Generally after a couple of days' rest in bed the patient will be able to reduce the tumors for himself.

Though it is difficult to conceive of a case of hæmorrhoids that cannot and ought not to be cured, where the patient is in any condition to bear treatment, there are some which can only be cured after prolonged preparatory treatment, and these are generally in women. The doctor who does much rectal practice becomes of necessity very familiar with many of the diseases of women. He will not be long in practice before he encounters the following combination: A lady comes to him with hæmorrhoids, upon which he operates, with perhaps the usual good result, though possibly only obtained after rather a slow and painful recovery. In the course of a few months the patient returns with much the same symptoms, though the hæmorrhoids have been cured. Another examination is made, and the patient is found to have an enlarged uterus with a lacerated cervix, a ruptured or greatly relaxed perineum, and a proctocele, all of which should have been cured before the operation for hæmorrhoids was attempted.

Many patients dread the taking of ether more than the operation itself, and will refuse radical treatment on this account.

When cocaine was first introduced I had great hope that this objection might in the future be overcome, but the drug has not fully realized the expectations held concerning it. Nevertheless it answers in a great many cases and should always be at hand. By it small tumors may be removed with absolute painlessness, and I have operated both with ligature and clamp under its influence, with great satisfaction in some cases of large tumors, but have been disappointed in others, before I found out by frequent trials the limits of its applicability.

Where the tumor or tumors to be removed are small, or where a single large one can be separated from others and cocaine be injected with the hypodermic syringe into the exact part where the ligature or clamp is to be applied, the drug will give satisfactory results. In this way several large tumors may be operated upon at one sitting, or at intervals of ten days or more, and the patient cured. But where the whole margin of the anus is involved and turns out with the hæmorrhoids, and where it is necessary to bring the entire circumference of the rectum for a considerable distance upward under its influence, the drug is apt to be unsatisfactory; for the reason that to bring all parts of the wall under its influence at one time, as is necessary in stretching the sphincter, dangerous symptoms may be produced before a sufficient quantity of cocaine has been injected to permit of painless operation.

In the New York *Medical Journal*, August 7th, 1886, I reported a case of this sort. It was necessary to dilate the sphincters, and with a large speculum carefully examine an exceedingly sensitive ulcer for a blind fistulous track emptying into it. One hundred and twenty minims of four-per-cent solution of cocaine were injected into eight different points around the circumference of the anus without giving sufficient anæsthesia to operate with any comfort; and on account of symptoms of general cocaine poisoning which developed, the operation was finished with ether.

The only explanation I have of the difficulty in getting anæsthesia of the whole of the lower end of the bowel, without sometimes using doses of the drug which are dangerous, is the actual very large extent of surface to be affected and the great number of sensitive nerves to be brought into local contact with the solution. On the whole, my experience has been that in minor operations the drug, when used hypodermically, is perfectly satisfactory; but in larger ones it is not to be relied upon absolutely, and may have to be supplemented with ether.

Let us now consider in detail the forms of treatment which have not already been described; and I shall hope to do so in a manner which will enable the practitioner to answer his patient's oft-repeated question, "How do you treat piles?" with the simple statement, "In a great many ways, depending on the case."

Of all the time-honored operative procedures known to the profession for the cure of hæmorrhoids, it is but a waste of time to discuss at the present day more than four—the ligature, the method of injections, the clamp, and the method of excision. The first of these owes its present prominence to Allingham, and is often described as his operation. In the way now generally performed the name is correct, though the treatment by ligature is very old.

The principle of his method is to dissect the hæmorrhoidal tumor away from its attachments for a certain extent, and then to surround the remainder of the base with a silk ligature. His belief is that the chief arterial supply to the tumor comes from above, and that all of the lower part may be dissected away from the muscular coat without causing any serious bleeding; while the ligature thrown around what remains is an effectual barrier against hæmorrhage. The advantage of this method is that the ligature is not placed around the skin at the margin of the anus, for this is divided with the scissors before it is applied, and the ligature lies in the groove thus made, and by this means much pain is avoided and much time is saved in the treatment.

Regarding the details of the operation but little need be said, so simple is it in its performance. The tumor to be tied is seized with strong forceps and drawn down, the patient having been etherized and the sphincter previously dilated.

With strong scissors the lower attachments of the tumor all around, and especially the point of junction of the mucous membrane with the skin, are divided; the ligature, which encircles what remains, is tied as tightly as possible, both ends are cut off short, and the greater part of the tumor below the ligature is also cut off, only sufficient being left to form a good and safe stump for the ligature to hold. The patient is prepared for the operation by the previous administration of a purgative, and the bowels are confined for a week or so after its performance, and then relieved by a cathartic.

This, in brief, is the operation practised by Allingham, and it is an exceedingly good one. I began my own practice by always performing it, and did I not believe that something else was better, should perform it still. It is as safe as any opera-

tion can well be, and when properly done it cannot fail to cure; and perfect safety and surety are two great points to be gained in any operation.

But a considerable experience with this operation led me after a time to begin the search for something just as safe and just as sure, without some of the objections which any large number of cases will be sure to show pertain to this method.

The first objection which developed itself in my own practice was the great pain which the patient often suffered for the first week or ten days. Allingham distinctly claims that after the patient has recovered from the ether there is often no pain. I can only say that though this is sometimes the case, it is by no means the rule in my own practice or that of other American surgeons. My explanation of the pain I have often seen is that a nerve is compressed by the ligature as well as an artery; but no matter what the explanation, the fact remains that, having followed Allingham's method in every particular, I have more than once been forced to keep the patient constantly under the influence of morphine till the ligature came away, and I know that many others have had a similar experience.

A second objection was the frequent necessity for the passage of the catheter for several days after the operation.

A third was the amount of blood lost during the operation, and the frequent necessity for leaving a considerable wad of lint in the rectum on account of the oozing, which caused great subsequent suffering and was only removable after three or four days, and then with considerable pain.

A fourth was the length of time required by my patients before they were able to resume active business.

It will be seen that none of these objections were of vital importance. The patients still recovered and were radically cured, and in the end were satisfied in spite of these difficulties; but still there seemed to me an opportunity for a more satisfactory operation.

For these reasons I was finally, by the advice of Henry Smith, led to adopt another operative procedure, which on the whole has served me better. I still occasionally use the ligature, but I never apply it where any of the sensitive tissue at the margin of the anus is included in the loop. If a tumor be well circumscribed and pendulous, and a ligature can be thrown around its base and still be well above the external sphincter, it may be applied without causing any great amount of reflex irritation or pain. In this way I have not infrequently seized a

prolapsing tumor of considerable size, injected it with cocaine, and after a few minutes tied a string around its base and cut it off without having much subsequent pain. But when it comes to a case of large, prolapsing, internal hæmorrhoids involving the margin of the anus and attended by a good deal of the eversion of the skin which is shown in Fig. 83, I prefer another operation, because I believe, though no safer and no more certain to cure, it will cause less subsequent pain, and less confinement to the house and bed, than the ligature.

Treatment by Injections.—As far as my own influence has

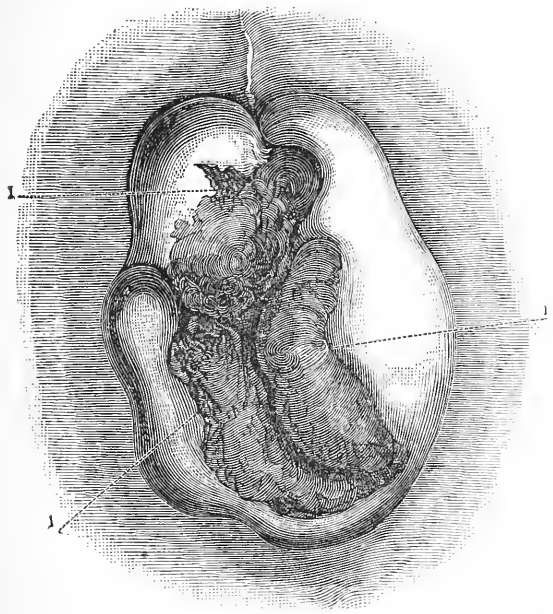

FIG. 83.—Internal Hæmorrhoids showing Line of Junction of the Skin and Mucous Membrane. (Curling.)

gone I have done what I could to take this method of treatment from the hands of the quacks and place it upon a recognized basis. In the July number of the *American Journal of the Medical Sciences*, 1885, I reported about two hundred cases treated by this plan with very satisfactory results, and in the New York *Medical Journal*, November 14th, 1885, in answer to numerous questions, I gave full and definite directions as to its methods of application.

The fact that since then I have had a succession of bad and troublesome cases treated by this means, and that these cases

have led me in a measure to be less hopeful of the results of the method, in no way invalidates the reports of my own carefully observed cases up to that time. In writing now I shall use less glowing terms than I did then, but I have by no means abandoned the practice. It is still, to my mind, a very good way of treating a great many cases, having in certain points exceptional advantages over all others; and in the fact that it does not apply equally well to all, and that it will occasionally be followed by disagreeable consequences, it in no way differs from other operations. I say this so plainly in the beginning because I have so frequently been accused of having first advocated the practice and subsequently abandoned it, while all that I have really done has been to state fully and freely the objections to it, as at other times I have with equal plainness stated the advantages of it. It is now at a point where every practitioner may try it for himself and come to his own conclusions regarding its value. All that can be said of my own practice is that while for a year or more I used it almost exclusively and was much pleased with its results, a succession of bad cases has led me to modify my views of its value and universal applicability, and that, though I now use it occasionally, it is only in selected cases.

For years back a great number of irregular and often very ignorant practitioners have been travelling around the country injecting *and curing* hæmorrhoids with solutions of carbolic acid. The instrument was an ordinary hypodermic syringe; the solution was for a long time a secret, but was finally discovered to be pure carbolic acid mixed with oil, or glycerine and water, in certain proportions. About the success of their treatment there could be no question in a great many well-authenticated cases upon ordinarily intelligent patients, who said that they simply felt the pricks of a needle and were cured. By this simple process large hæmorrhoids which had been bleeding and protruding for years disappeared after a single visit, and this often without any subsequent pain or symptoms of any sort. So often was this delightful story told me by patients upon whom I had recommended other and to them more formidable procedures, that I was at last driven in pure self-defence to try and discover what there was in this practice, and I therefore armed myself with several preparations of carbolic acid—a fifteen per cent, thirty-three per cent, fifty per cent, and the pure acid—and proceeded to inject them into a large proportion of my cases.

The results in many cases were surprisingly good. Some

were cured without being confined to the house at all, and without any pain which interfered with their daily occupations. Others did not do quite as well. They complained of severe pain coming on an hour or so after the injection and lasting several hours, but it was rare to have them give up their work and go to bed, or to use the opium suppositories with which they were provided in case of necessity. Once in a while the injection would cause a slough and this would put an end to the treatment for a couple of weeks till it had healed ; but the pain of this condition was generally bearable, and the patients expressed themselves as perfectly satisfied and greatly preferring even this amount of suffering to any "operation." The cures also seemed

FIG. 84.—Hypodermic Syringe for Injecting Hæmorrhoids.

to be permanent ; none of my patients returned with a fresh protrusion of the tumors which had once been operated upon, even after an interval of many months. At this time it was rare for me to have the tumors slough after an injection. Generally there was a hardening and shrinking of the hæmorrhoid sufficient to prevent either hæmorrhage or protrusion, and this was produced by solutions of thirty-three per cent and fifteen per cent.

At this time I published my cases and also the rules which were to be followed in this method of treatment.

The solutions of carbolic acid were made in pure water with sufficient glycerine added to make a perfectly clear and colorless mixture, and of these I kept constantly ready one of fifteen per cent, one of thirty-three per cent. and another of fifty per cent.

The glycerine and carbolic acid should both be perfectly pure, and as soon as the solution begins to turn yellowish it must be discarded.

The needles should be fine and sharp, and the syringe in perfect working order—one with side handles (Fig. 84) is preferable —and after each time the syringe is used it should be thoroughly washed out and left standing in fresh water.

Before making an application give an enema of hot water, and let the patient strain the tumors as much into view as possible. Then select the largest and deposit five drops of the solution as near the centre of the tumor as possible, taking care not to go so deep as to perforate the wall of the rectum and inject the surrounding cellular tissue. The needle should be entered at the most prominent point of the tumor. If the hæmorrhoid does not protrude from the anus, a tenaculum may be used to draw it into view. After the injection has been made the parts should be replaced and the patient kept under observation for a few minutes to see that there is no unusual pain. The injection will cause some immediate smarting if it is made near the verge of the anus; if made above the external sphincter, the patient may not feel the puncture or the injection for several minutes, when a sense of pressure and smarting will be appreciated. In some cases no pain will be felt for half an hour, but then there will be considerable soreness, subsiding after a few hours. If it increases instead of disappearing, and on the following day there is considerable suffering, which may not perhaps be sufficient to keep the patient on his back, but is still enough to make him decidedly uncomfortable, it is a pretty good indication that a slough is about to form. For the reason that it is impossible to tell absolutely what the effect of an injection is to be until at least twenty-four hours have passed, it is better to make but one at a visit and to wait till the full effect of each one is seen before making another. If on the second day there is no pain or soreness, another tumor may be attacked; and this will often be the case.

By following these rules all went well for a time, but soon I began to be troubled with a constant succession of sloughs with their attendant pain, and the worst of the trouble was that I never knew beforehand when a slough was likely to be caused. My old solutions were all discarded and new ones made to replace them; the syringes were all sent away and renewed; and yet the sloughs continued, and I began to expect to encounter this objection whenever an injection was made, for the strength

of the solution or the character of the hæmorrhoid seemed to make no difference. A solution of fifteen per cent would cause sloughing where one of fifty per cent. or even of the pure acid, would produce only a circumscribed induration, and *vice versa;* so that after a time I was forced to confess that I had no means of determining beforehand whether the patient was to undergo the pain of an inflamed and sloughing hæmorrhoid, though the injection made should be of ten per cent or of pure acid.

The next complication was the occasional occurrence of small marginal abscesses after injections, and as these always caused a great deal of pain this was a serious objection. They usually appeared three or four days after the injection, and were situated just at the verge of the anus, causing a tumor about the size of the end of the thumb, covered partly by skin and partly by mucous membrane. They showed a decided tendency to break on both the mucous and cutaneous surfaces, and leave a short, subcutaneous track connecting the two openings.

These marginal abscesses were never at the point of the injection, though always on the same side of the gut; sometimes, in fact, they were fully two inches below the injection.

Still these complications were not of sufficient gravity to cause an abandonment of this plan of treatment. The small abscesses caused a good deal of pain, but were not serious in their ultimate consequences; and the sloughs healed kindly with the aid of local applications, though they greatly prolonged the time of treatment, as I always thought it best to discontinue the injections, after once a slough had formed, until it was entirely healed.

There are, however, still other objections to this method of treatment. In my own practice I have had one case of diffuse inflammation and suppuration, lymphangitis, ischio-rectal abscess, and deep fistula following a single injection of strong acid into a small tumor; and I have heard of other cases in the practice of other surgeons. I believe that this serious accident was due to landing the strong acid entirely below the tumor and under the muscular coat, but I cannot be sure.

Again, within the past year I have several times been called upon to treat a rare form of fistula arising directly from injections. These fistulæ were of the blind internal variety, having an opening near the anus within the sphincters, and a track running upward from this under the mucous membrane for a considerable distance, and ending in a *cul-de-sac*. One of these cases was in my own practice, and three different tracks of this

kind existed, each of which I have no doubt was caused by an injection of carbolic acid made by myself. As I have no objection to reporting my own bad cases, that others may derive the same benefit from them that I do, I will give this in full.

The patient was a professional man of middle age, who had long been a sufferer from hæmorrhoids of large size, and was in a very weak condition, having lost much blood, become dyspeptic and nervous, and having slight pulmonary trouble. The tumors were quite large, the sphincter much relaxed, and the margin of the anus very much like what is shown in Fig. 83. Injections were made several times, the solutions used being the weaker ones and never exceeding thirty-three per cent. On the day following the first one the following entry was made in the case book: "Considerable pain following first injection. Patient has been in bed most of the time." Two days later the following entry was made: "The single injection of five drops of a solution of carbolic acid (one to twelve) has caused great pain up to the present time. The patient has been able to be about more or less, but has suffered constantly and taken considerable quantities of opium. Examination shows the mass of tumors on one side black, inflamed, and angry-looking; and though the injection was placed in a small nodule springing from the centre and most prominent portion of this mass, the whole group has become involved in the inflammation it has caused." Three months later the following note appears: "The patient has had considerable sloughing of the tumors, following the injections of a thirty-three-per-cent solution, and has had one marginal abscess, leaving a subcutaneous fistula which has been cut. He is now in great measure relieved." In exactly four months from the beginning of the treatment the patient was discharged cured—that is, he considered himself cured, there being no more protrusion, except as the margin of the anus tended to roll outward, and no bleeding. Nine months after the first injection he visited me and still reported himself as having no symptoms. Eighteen months from the time treatment began the patient again reported with several hæmorrhoids, which were attached high up the bowel and had only recently begun to appear at the anus, and a few days later the following note was made: "Two injections (thirty-three per cent) without trouble. Yesterday, third injection of thirty-three per cent into a distinct tumor. To-day, slough size of a silver quarter, irregular in shape, and in addition a marginal swelling size of a walnut." The slough separated, cicatrization pro-

gressed slowly, and at the end of a month the patient went away, having no more hæmorrhoids, but in their place an unhealed ulcer, which seemed to be doing well and bid fair to be entirely healed in a few days.

One year later he reappeared and reported that this ulcer had never entirely healed, but had gone on discharging and causing pain ever since. After several examinations I discovered three of the blind internal fistulæ already described, and in addition two more large internal hæmorrhoids. The patient having now been under treatment two and a half years, he was etherized and operated upon. The fistulæ were laid open and the hæmorrhoids removed with the clamp, and the patient finally discharged cured. This is a very long way around to reach a very simple result.

I have noticed that each of these fistulæ were of the submucous variety, running in the connective tissue between the mucous and muscular layers, as it might be inferred that they would be; for the acid is deposited by the needle between these two layers, and the amount of sloughing it causes is not limited to the point at which it is introduced.

It may perhaps be instructive to record one or two more cases.

In June, 1885, I was called upon to treat an old gentleman, the mayor of a small town in Ohio, living in a high, cool, country region, but much depressed with business losses and worry. He came to New York in the middle of the hot season and submitted to treatment. The hæmorrhoids were the worst which, up to that time, I had ever treated by this method. The sphincter was much relaxed; the tumors had been down for twenty-five years without being replaced, and were very large and vascular. There were three distinct masses, each about the size of a hen's egg. The case was not an attractive one, considering the age and condition of the patient and the hot weather, but I undertook it. Into the largest of the three tumors I injected five drops of a fifty-per-cent solution. It was followed by a good deal of pain and loss of sleep for two nights, with some constitutional disturbance. On the third day, the pain of the first injection having somewhat subsided, I injected five drops of pure acid into the second tumor, and had much less trouble than with the fifty-per-cent solution in the former case. After three days more I again injected the same amount of pure acid into the third tumor. Both of these last applications caused a distinct slough, with resulting ulcerated surface and free discharge of bloody

matter. After a few days more I returned to the first tumor, which had not sloughed but simply become indurated, and injected five drops of pure acid into that. The applications were all made within the space of two weeks. During this period the patient allowed his bowels to become constipated, and I had to clean them out with repeated copious enemata. There was at one time some vesical irritation and decrease in the amount of urine, whether from direct absorption of carbolic acid or from reflex irritation I do not know, and at the end of the treatment the patient was considerably reduced in strength—so much so that I put him upon the most nourishing regimen with bark and whiskey. Just as he seemed on the point of rallying I discovered a small abscess in the perineum, which was opened, and healed kindly, having no connection with the rectum. After recovering from this and gaining a considerable degree of health he went home to Ohio, and was immediately brought to bed with a second, larger abscess on the buttock. From this he also made a good recovery, and for one year he had no rectal symptoms whatever, but at the end of that time, he informed me, bleeding had returned, and, though I have not seen him, I have little doubt that he is suffering again from the same tumors.[1]

This patient had his own way. He was not "operated upon," but he would have had less suffering and less confinement if he had been. Moreover, he would have been radically cured. I can safely say that no operation I have ever performed with the clamp and cautery has caused the patient as much suffering or me as much worry as this one by injections.

Let us now take another. A man of about sixty has had hæmorrhoids for twenty years. He is of sedentary habits and nervous, but with no other disease than the tumors. An examination shows a very advanced case of long-standing trouble. The tumors can be divided into four chief ones—one posterior, one anterior, and one on each side; but two of these are as large as hen's eggs, and the others only a trifle smaller. They spring from above the sphincter and are entirely covered by mucous membrane; the sphincter is so relaxed that they protrude with the slightest exertion, and the patient has worn a rectal supporter for years.

It is a beautiful case for the clamp, and fit for that only; but at the outset I am met fairly by the not infrequent obstacle—"no operation." Argument is useless; he has heard of carbolic

[1] Previously reported in part, N. Y. Medical Journal, November 14th, 1885.

acid; in fact, his physician has sent him to me for that treatment, and it is that or nothing. Unwillingly I consent.

An injection of thirty-three per cent is made posteriorly, and, with the usual caution and instruction, the patient goes home. Two days later he returns. He has had pain—yes, considerable; but he does not mind the pain as long as he can avoid "an operation." Another injection of the same strength on the left side.

It is four days before he again appears, and they have been passed mostly in bed, and he has used several suppositories; but he is now better, and "if it is no worse than this he can stand it." The tumor injected last time is much smaller, but the posterior one, which was first attacked, is not much benefited, and five drops of pure acid are placed in its centre.

Three days later he reports that he is beginning to be better, that there is less protrusion at stool, and he has left off his supporter. The last injection has not caused a slough, but a hard, inflammatory induration in the centre of the tumor. Another five drops of pure acid are injected into the same mass at a little distance from the hard spot, and he then tells me that ever since his last visit he has had considerable difficulty in passing water, which is high-colored and diminished in amount.

Four days later, says he had no very severe pain after the last application, and straining at stool fails to bring down either of the tumors which have been operated upon. Another injection of pure acid into the anterior tumor, the largest of them all. Three days later he reminds me that he is in a great hurry to go away on business, and is anxious to have treatment crowded more rapidly. He had no pain at all after last injection, and fears I did not get it in. The injection has again caused a hard lump of inflammatory induration, but no slough, and a decrease of about one-third in the size of the mass. There is still more work to be done on the first one, and another five drops of pure acid are injected into it, causing no pain at the time or after, as he tells me two days later.

Thus far all had gone well, and three of the tumors had been treated without accident. An injection of pure acid was made into the last one, that on the right side. Three days later I am sent for to come to him. Before this he has come to me, but he has been in bed ever since the last injection. The urine has been very scanty and passed with difficulty; there is an enlarged and painful gland in the right groin, and a painful swelling at the verge of the anus on the right side, circumscribed, the size

of an almond. Eleven days later, the patient being still confined in bed, the abscess at the margin of the anus was opened and a drachm or so of pus evacuated. A couple of days later it was found to have also opened spontaneously on the mucous side of the swelling, just within the sphincter. Ten days later this was healed. The patient had then been under treatment just forty days. He was much better. The tumors were all considerably reduced in size; they still protruded at stool, but went back spontaneously; and he promised to report again in a few days. He never did.

In this case also the patient would have been much better off, both during the treatment and in the end, had he been operated upon in my way instead of his own. In fact, it is a few such cases as this that have led me to lay down the invariable rule of practice to which I have referred—to select the mode of treatment which seems to me most appropriate, and never allow myself to be led into another which I do not think as good, simply because the patient wishes it.

These cases are the bad ones, and I would not convey the idea that all are like them. They illustrate exceedingly well all of the objections to this plan of treatment which I have ever encountered, except the single one of deep inflammation and suppuration. They may be enumerated in the following order :

1. Pain.
2. Ulceration.
3. Marginal abscess.
4. Fistula.
5. The impossibility of giving any definite prognosis as to the length of time necessary to effect a cure, or the amount of suffering the treatment will entail.
6. The fact that the treatment does not result in a radical cure, but that the tumors may reappear.

There is still one other complication which may arise, and this is decided vesical symptoms, whether from carbolic-acid poisoning or merely from reflex irritation I have never been able to decide. I have seen the urine decidedly diminished, and great pain in passing it, after injections of the stronger preparations, but I have never seen the typical train of symptoms following carbolic-acid poisoning.

It will be seen that none of these objections are vital. Any of the well-recognized methods of operation are attended by some pain, and occasionally by untoward accidents. I do not consider the operation by injection as dangerous to life, and I have

never yet seen a fatal case, though several have been reported by Andrews; and in all of my experience with the method I have never had but one serious complication—a single case of deep suppuration; and even this I think can be avoided by the use of weaker solutions placed more superficially.

There is still one point about which there should be no misunderstanding. From all the information attainable, I believe that my experience with this method is about that of the irregular practitioners who thrive by it, and that the proportion of cures, without any pain or bad symptoms, obtained by them is practically the same as my own. I have certainly tried all of the solutions ordinarily used by them, and some besides. The tincture of iron and the fluid extract of ergot are two from which I hoped for better results, but neither seemed to possess any advantages. From cases which have from time to time come to my knowledge, I know that abscesses, ulceration, and great pain are by no means unusual sequelæ in the practice of these gentlemen. It is not long since one of this fraternity was forced by his patient to return the fee which had been paid in advance, after the patient had been confined to his house for several weeks with a deep abscess; and only a few days ago I operated with the clamp upon a gentleman who had previously had a single injection made by one of these men, had been confined to his bed with it for a month, and had then abandoned the treatment. He had been particularly unfortunate, as he had subsequently had a ligature applied by another practitioner, which, as he described it, "slipped on the fourth day," and he had then abandoned that treatment also.

I believe I have now fairly stated the advantages and disadvantages of this plan of operating upon hæmorrhoids, and have put, as far as my own experience enables me, each reader in position to choose for himself whether he will use it or not, except in one particular. All of the patients I had supposed cured by this method, and upon whose cases I based my former favorable report, are now returning to be again cured by some more lasting method. The relief afforded by this means seems to last about four years.

The question, in fact, narrows itself down to this: On the one hand we have a method of treatment which is safe, certain, and practically painless, but which involves the administration of ether, the performance of what the patient dreads, a surgical operation, and a certain confinement to the house for a few days. On the other hand we have a method which avoids the

ether, the surgical operation, and perhaps the confinement to the house, but which, in fact, involves fully as much of an operation as the other, only more quickly performed, and which is neither radical nor certain in its results. It is, in fact, this uncertainty as to the course of a case after an injection, and the fact that the operation does not result in a radical cure, even though it may be followed by serious complications, which keeps me from employing this method oftener, rather than the complications themselves or the possible dangers. I have never abandoned the idea that the patient should submit to the judgment of his physician as to his treatment, and I am not convinced that the surgeon should yield his preference for a method of treatment which long experience has proved to be as safe and certain as any operation in surgery, to the foolish prejudices of a timid patient.

As regards the comparative suffering caused by the two operations, the clamp and the injections, it may be taken for a fact that any considerable number of cases will show greater pain spread over a longer time with the latter than with the former; and all the patient actually gains in the most favorable case is the avoidance of a safe operation which he fears, while he submits to an uncertain one which he does not fear because of his ignorance, together with a few days of liberty during which he would be better off in his room.

Should the surgeon decide to employ this method, the following points may not be useless:

Use the weaker solutions in preference to the stronger.

Never use it in any of the forms of external tumors already described.

In cases of large, prolapsing, and long-standing disease, expect pain and perhaps marginal abscesses.

Be very cautious in prognosis as to the time the treatment will require and the amount of pain it will cause. In fact, it will generally be safer to acknowledge the uncertainty as to these two important points of the operation. Expect a return after about four years.

The form of disease best adapted for this treatment is the tumor of moderate size, pendulous, and springing from the wall of the bowel entirely above the sphincter. Such may be replaced within the bowel after the injection, and are very likely never again to be heard from; and should sloughing occur in them, it will be attended by the minimum amount of suffering.

The injection of hæmorrhoids with carbolic acid, though apparently a simple and trivial affair, is to be regarded in the light

of a surgical operation, and should not be undertaken by the practitioner until he has surrounded himself and the patients with all the safeguards at his command.

The Clamp and Cautery.—After what has been said, the reader may be tempted to ask whether we possess any means of curing hæmorrhoids which is safe, certain, and free from complications, and I shall now try to answer that question in the affirmative.

The operation with the clamp is generally known as that of Mr. Henry Smith, of London, and to him it owes its general in-

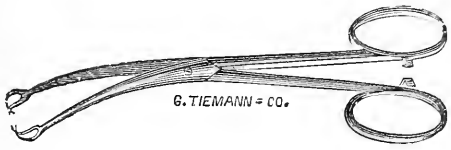

Fig. 85.—Pile Forceps.

troduction and acceptance by the profession, as does the ligature to Mr. Allingham; though he claims no originality in the method itself, but only in some of its details.

The essential idea of this operation is to seize the part to be removed, apply the clamp to its base, cut it off with scissors, and cauterize the stump. The clamp acts merely as a temporary ligature to prevent bleeding during the operation; and the

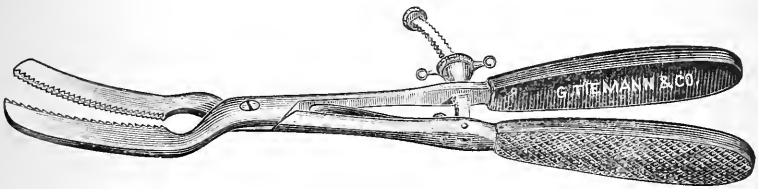

Fig. 86—Author's Clamp.

cautery is to prevent bleeding after the clamp has been removed. The instruments which are indispensable are therefore four in number—a hook forceps to seize the pile, shown in Fig. 85, the clamp shown in Fig. 86, scissors, and the cautery.

The clamp is a modification of Mr. Smith's which I have had made for my own convenience, and the difference can be seen at a glance. Mr. Smith's instrument (Fig. 87) is armed with ivory shields to prevent the possible effects of radiated heat, it has scissors handles, and the edges of the blades are smooth. In my own there are no shields, the handles are much larger, and the

blades are now smooth and not serrated. I was led to abandon the ivory shields because I found them practically unnecessary and because they made the instrument more cumbersome. The handles were modified to give increased power and to avoid the general use of the screw for closing the blades. The edges were at first serrated to add to the crushing force; but experience has convinced me that even with this amount of power the clamp is incapable of crushing the tissues to any extent, and I have discarded the serration for antiseptic reasons. I have placed it on a tumor, screwed it up to its greatest possible power, and left it in this condition for fifteen minutes. While it was in position the hæmorrhoid became cold and livid, but when the pressure was removed the vessels immediately filled up and the circulation was restored. It is for this reason that I say the clamp acts merely as a provisional ligature during the operation. In fact,

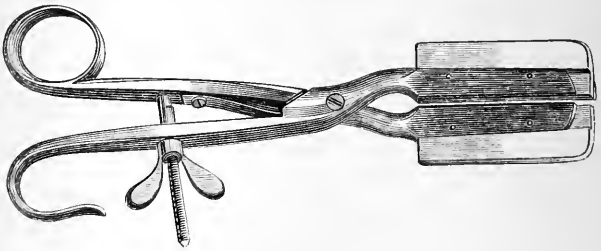

Fig. 87.—Smith's Clamp.

no force capable of crushing the tissues to the point of causing the occlusion of the vessels and the death of the parts can be exercised without much greater mechanical power than this clamp possesses. Allingham's crusher will do it, but this is of the nature of a vise. There can be no bleeding while the clamp is in position, if the handles are firmly closed with one hand; but unless the cut surface has been thoroughly cauterized, there will be immediate bleeding on its removal. The advantage of the form of handle shown in my instrument over that of Mr. Smith is that an adequate pressure can be kept up for any length of time without the intervention of the screw, and by this fact the length of time consumed in operating is much diminished.

The cautery is the most important of all the instruments, being the most delicate. The latest modifications of Paquelin's instrument leave little to be desired. If the operator prefer, he may use the galvano-cautery, and with a storage battery this is a very convenient form of instrument; but I have not yet in

my own practice abandoned my old favorite for the newer invention. The Paquelin cautery is shown in Fig. 88, and may be obtained from Tiemann & Co., of New York, at a cost of about thirty dollars.

Its beauty lies in its reliability and portability, and for these reasons I always carry it with me for operating at long distances from home. Filled before starting, it can always be used on the following day, or after two days; and should the operation be very extensive, as in cases of cancer, it is only necessary to be provided with an additional ounce or two of benzine. The instrument merely requires to be properly understood and man-

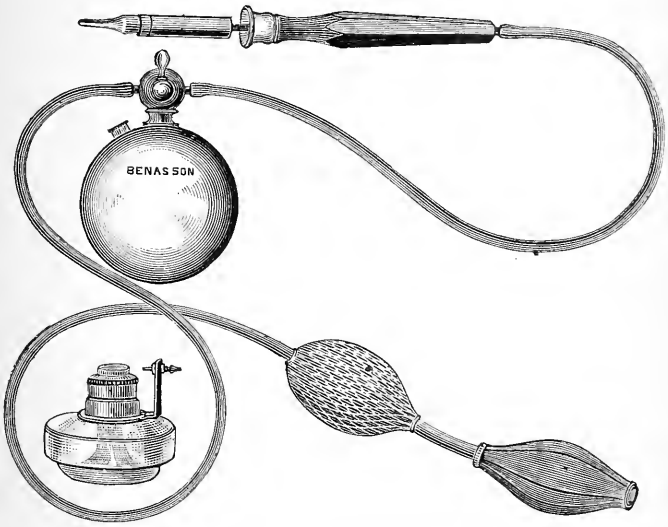

Fig. 88.—Paquelin's Thermo-Cautery.

aged to secure perfect reliability, though I always carry an extra platinum blade, to be secure against the temporary disabling of one, which generally is due to the lack of experience of an assistant.

The scissors need only to be strong and moderately long, though a slight curve in the blades will sometimes be found an advantage.

Various forms of forceps for bringing down hæmorrhoidal or other rectal tumors are shown in Figs. 89 and 90.

Very little preparation for this operation will be found necessary in a healthy patient. When one in good health tells me his bowels are acting regularly, I have about abandoned the time-honored custom of deranging their action with a purgative just

previous to this operation; and if they have moved on the morning of the operation, all that is necessary is a simple enema of soapsuds an hour before the operation begins. If given an hour before, it will generally all be passed before the arrival of the surgeon. If given after the arrival of the operator, he stands a good chance of receiving a large portion of it in his lap and on his towels the moment he dilates the sphincter.

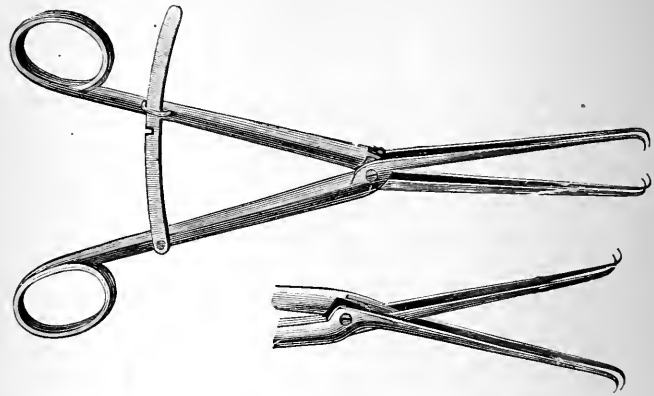

Fig. 89.—Forceps for bringing down Hæmorrhoids.

The operation is performed in the following manner :

As a rule the patient is etherized, though, unless there is a good deal of tissue to be removed at the verge of the anus, the operation may be done with cocaine. Ether should be advised in almost every case, and cocaine only used as a substitute; for

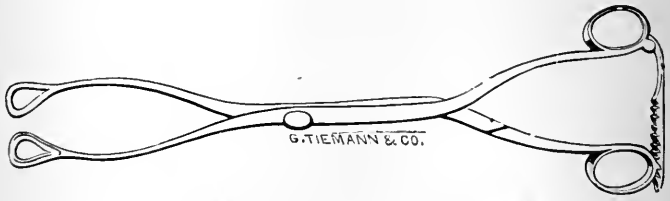

Fig. 90.—Luer's Hæmorrhoidal Forceps.

although a tumor which is visible may be removed with the latter, it is difficult to thoroughly stretch the sphincter under its influence, and by omitting this two great advantages of ether are lost—the chance to thoroughly search the rectum, and the avoidance of the pain following the operation, which is secured in part by a complete paralysis of the sphincters. Many hæmorrhoids which are not visible at an ordinary examination will

become visible after a patient has been etherized and his sphincter dilated; and it is an awkward thing to assure a patient that he is radically cured because three or four perfectly visible tumors have been removed, and have him return in a few weeks with one or two more, which were overlooked at the operation simply because they did not crowd themselves into view.

The tumors are next seized and removed one by one. No speculum is necessary for this, but if one be used a medium-sized blade of Sims's vaginal speculum, or the retractor shown in Fig. 22, will be found most convenient. The tumor is seized with the forceps and held by the left hand till the clamp is applied with the right. The forceps are next detached, the tumor cut off with the scissors (but not so short but that a good firm stump remains), and the cautery is then taken from the assistant, whose sole duty should be to have it always ready, and applied thoroughly to the stump of the hæmorrhoid. No haste should be used in this step of the operation. The pedicle should be thoroughly charred with the platinum at a dull red heat. When this has been done, the clamp may be loosened without being removed, to see if any vessel in its grasp is still inclined to bleed; and if a bleeding point appear, it is again tightened and the cautery is again applied. Thirty seconds is an abundance of time for each tumor, and I have often done four to the minute—the greater part of this being devoted to the thorough application of the cautery. The secret of success in this operation is found just here. If all the cut surface is thoroughly cauterized while the clamp is on, there can be no hæmorrhage; but if more surface is cut than is cauterized, hæmorrhage may reasonably be expected and the operator is to blame. Thoroughly cauterize the entire incision and trust nothing to the clamp or to nature, is the advice I always try to impress most strongly on those studying this operation.

When all the piles have been removed, the stumps will naturally retract within the sphincter and no dressing will be necessary.

The thing most difficult for the unpractised operator to understand is at just what point to apply the clamp; and this can best be learned by experience, as it really constitutes the delicate point in the operation. There is no difficulty when the tumor is an internal one arising fairly from the mucous membrane above the sphincter, and not involving the skin of the anus. In such a case the clamp does not implicate the muco-cutaneous junction at the anus, and removing too little tissue will not leave un-

sightly and annoying tags of skin, nor will removing more than is necessary result in cicatricial contraction to a serious extent. But where the margin of the anus tends to roll over, as is shown in Fig. 83, considerable experience is necessary to learn just how much tissue to include in the clamp.

In such a case a groove should be made with the scissors in the cutaneous border for the application of the clamp, so that no skin may be included in its grasp. If this groove is made at the line of junction of mucous membrane and skin marked in the figure, painful tags of skin will certainly be left, which will cause subsequent annoyance and considerably detract from the success of the operation. If, on the other hand, all the protruding mass be cut off, and the clamp be applied in the groove where the protrusion joins the anus, too great contraction is apt to result, except in cases where, on account of a very lax sphincter, it is deemed advisable actually to reduce the size of the orifice. The endeavor must be to so draw the line between these two extremes in an ordinary case as to leave no tags after cicatrization, for these are always unsightly, generally annoying, and sometimes subject to a subacute inflammation which renders it desirable to remove them by a subsequent operation with cocaine.

When it is necessary to divide the skin of the anus with the scissors before applying the clamp, there will be a little bleeding, which is easily stopped by a compress and bandage; but when the clamp is used without any preparatory cutting, the operation is almost bloodless, and under any circumstances it is unnecessary to soil more than a single towel. This is a great desideratum in cases of enfeebled patients, besides enabling the operator to have his wounds perfectly dry without the use of any lint or other dressing.

The operation with the ligature, as done by Allingham, by previously cutting away a part of the attachment of the tumor, is by no means bloodless, and unless the operator takes the risk of being called back after a few hours to stop the oozing of blood, he is apt to use considerable lint, and, having pressed it into the wounds, to leave it. This is a constant source of pain, and often it is practically impossible to remove it before the end of the third or fourth day, when it has become thoroughly loosened by the discharges.

A rectum partly stuffed with lint, and containing three, four, or more ligatures around sensitive parts, is in a very different condition from one which contains no foreign substances, and

the wounds of which have been dressed in the most thoroughly antiseptic way possible with the cautery in the act of making them. One condition may be no safer than the other, but it is certainly much more comfortable.

No dressing of any sort is necessary after the clamp operation. If the patient seems to be doing well and complains of no untoward symptoms, the parts need not be examined for ten days, and all that is required is cleanliness to the wound.

I formerly introduced an opium and belladonna suppository at the time of the operation, but have now abandoned even this. The bowels should be confined for forty-eight hours, and about thirty-six hours after the operation—in other words, at night of the following day—they should be encouraged to act by a slight laxative, either a pill or a saline. A single dose will generally be sufficient, and when the time comes for the bowels to move an enema of oil should be thrown up the rectum to facilitate the passage. In this way an almost complete clearing out of the rectum is secured on the second day. The patient dreads this first motion, but is agreeably disappointed, often being surprised that he has much less pain than his hæmorrhoids caused him in each passage before they were removed.

The bowels may be treated in this way after Allingham's operation with great advantage, though his rule is to have them confined for a week or more. By the one method a comparatively, and sometimes positively, painless evacuation is gained before the rectum has become loaded with solid matter. By the other, the pain which is sometimes and generally caused needs to be seen and felt to be appreciated. I have left my bed at night, roused my assistant, driven to an adjacent city, given ether, and unloaded a rectum on the seventh day after an operation, in a delicate, nervous lady, after the rectal tenesmus had reduced her to a condition of unmanageable hysteria, in spite of trained nurse, repeated saline cathartics, and enemata of all sorts ; and one experience of this sort of unnecessary suffering will convert almost anybody to the other plan.

An additional advantage of thus moving the bowels on the second day is that the rectum is cleansed of all blood and discharges, and that no special restrictions need be placed upon the patient's diet, while much headache and general malaise which follow the constipation produced by the daily use of opium are avoided.

I have recently been tending a case where much trouble resulted from an unintentional departure from this rule. The

usual operation was done with a simultaneous closure of a lacerated cervix uteri, and at the end of forty-eight hours the usual laxative was given.

I was told on the following day that it had acted nicely, and it was ordered to be repeated every night for the following week. Each day the patient was reported as doing well in this regard, though once or twice it was necessary to give two pills simultaneously when the bowels seemed to be acting irregularly. On the tenth day the patient was up and about, preparing to leave the city for her home. On the eleventh she had an attack of intestinal and rectal pain, and after a great deal of straining and suffering passed a very voluminous and hard passage with considerable blood. It was evident that the bowels had not been effectively moved since the operation, and the result of her efforts was a tearing open of the wounds and a further confinement to the house for nearly three weeks, each movement of the bowels being attended with some pain and bleeding.

I do not wish to convey the idea that no pain follows this operation, but I can honestly say that many patients have less pain on the day following it than they have suffered daily from their hæmorrhoids for years before. I usually expect some of that annoying spasm of the levator which no stretching of the sphincter can prevent; and when this is present it will begin a few hours after the ether, and may last for the following day or two; but it is not generally sufficient to prevent a good night's sleep, and it is often so slight as to cause no comment by the patient. It is very exceptional for any anodyne to be necessary, even on the first night after operating. Even this spasmodic contraction of the muscle is not always present.

The length of time the patients are confined to the house of course varies. They are generally sitting up on the second day, or at most the third, and walking around the room tending to their own wants, the men smoking and reading, the women receiving visits or sewing; and one of the details about which the physician needs to be most strict is to keep the patient quiet in the house until the healing has so far advanced as to make active exercise safe. Many of my own cases come from a considerable distance and are anxious to return to their own homes as soon as possible. I usually aim to secure at least ten days, but I find they are very apt to depart at the end of a week, and occasionally five days sees them on their journey. I do not mean that this should be encouraged or recommended, for it is very much better that the patient should remain quiescent until the

wounds are well advanced toward cicatrization ; but it shows better than anything else the general condition of the patient when there is no suffering which induces him to wish to stay in his room.

The Operation of Excision, or Whitehead's Operation.—This operation consists in amputating the entire "pile-bearing" region of mucous membrane. An incision is made around the anus at the junction of the skin with the mucous membrane ; the latter, with the hæmorrhoidal tumors, is dissected upward till the upper limit of the hæmorrhoids is passed, and then amputated by a circular incision. The mucous membrane is then drawn down from above and stitched to the skin. Various

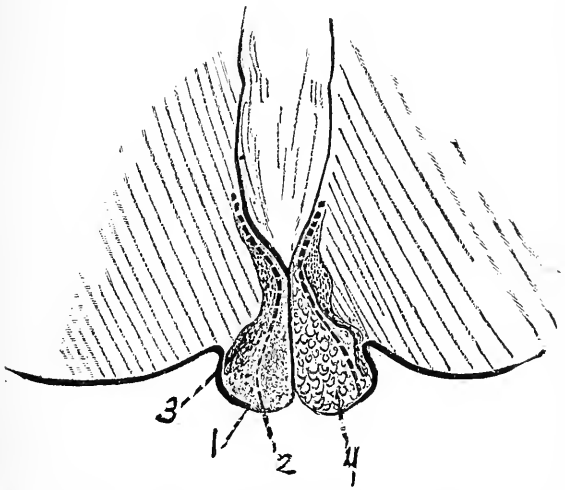

FIG. 91.—1, Muco-cutaneous junction, exaggerated; 2, line of incision, a short distance from muco-cutaneous junction; 3, external sphincter muscle; 4, protruding pile. (Weir.)

modifications have been made in the technique, all intended to facilitate the performance of a naturally difficult, tedious, and bloody operation ; but no essential change has been made in the guiding principle.

After separating the mucous membrane at the anus by scissors all around, at one limited spot Weir [1] carries the dissection deeper in an upward direction until the normal mucous membrane of the bowel is reached. From this point, by means of the finger-nail or with the end of a blunt curved scissors, the mucous membrane can be stripped from the external tissues down close to the circumferential initial incision about the anus,

[1] Med. Record, July 14th, 1888.

when any intervening tissues can be cut through quickly with

FIG. 92. (Allingham.)

the scissors. In this way, proceeding right and left, the separa-

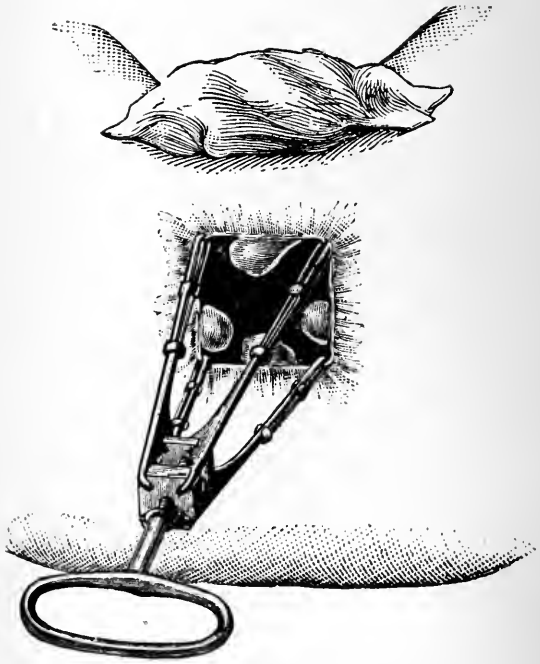

FIG. 93. (Allingham.)

tion of the bowel may be accomplished with decidedly increased

rapidity and certainty. He has also dropped the introduction of the drainage tube, and he does not dust the surfaces with iodoform, though he uses the usual sublimate solution of 1 to 5,000. He makes the correct point that piles invade the submucous connective tissue, and hence have to be cut *through* in the first steps of the dissection instead of being *dissected off*. The great point in operating is to make the circumferential incision, not in the line of junction between skin and mucous membrane, but in

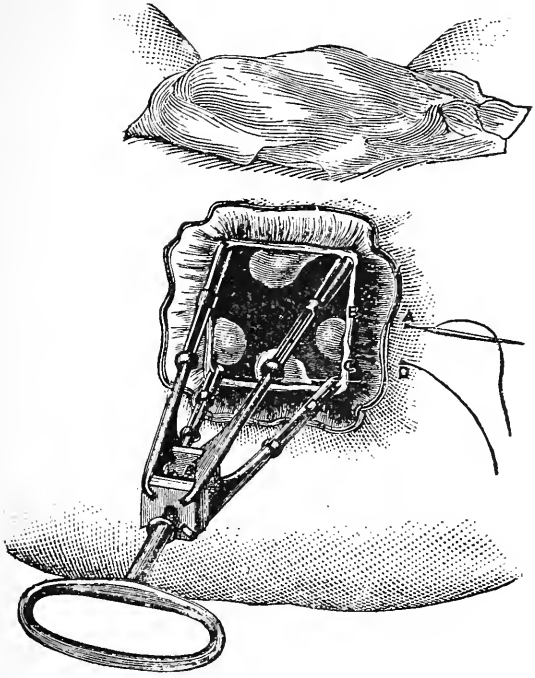

Fig. 94. (Allingham.)

the mucous membrane itself inside the line of junction. In this way only can a stricture of the anus be avoided. (See Fig. 91.)

Allingham, Jr.,[1] has discovered many disadvantages in the method, arising from the lax and irregular condition of the anus and the resultant trouble in separating the mucous membrane from the skin; the time required in twisting the vessels if the case was a bad one; and the length of the operation. He has tried to improve the method by the use of the instruments shown in the cuts.

After the dissection of the mucous membrane has been

[1] The Med. Press, June 27th, 1888.

made, he varies the operation as follows: Opposite the position of any large pile he takes up the skin at D, Fig. 94, with a needle fitted with a medium catgut ligature. This he passes through the mucous membrane at C, and then around the stem of the pile. It is again returned through the mucous membrane at B, and lastly through the skin at A. Thus a loop is placed under the bowel, with the two ends coming out through the skin. The ligatures are then tied up just tightly enough to prevent hæmorrhage when the piles are cut off. Each pile is treated in the same way. The drawn-out pile area still attached to the clamp is now to be cut off just in front of the ligature, and finally a few ligatures are put in so as to bring to the skin the mucous membrane between the piles.

The operation is based by its inventor upon the following propositions, all of which appear to be at least open to discussion. He says: "During the first five years of my professional career I employed the ligature in the few cases of severe hæmorrhoids that came under my treatment. I operated according to the most approved method of that time, cutting through the skin and mucous membrane, and applying the ligature in the artificially produced pedicle. The number of cases operated upon did not, perhaps, exceed a dozen; nevertheless they were sufficient to convince me that the ligature by no means produced a radical cure. One of my patients returned almost as bad as ever, and the reports I heard of another were anything but satisfactory."[1]

This statement is so obviously open to criticism that it seems almost heartless to comment upon it. A young man in early practice operates a dozen times, and two of his cases are failures! Older men operate thousands of times and never have a failure! Whatever else may be raised as an objection to the operation by ligature, this, we believe, is the first time it has ever been impeached on the ground that it was not radical. Men have objected to it because it caused pain, because it had been followed by untoward consequences, and because they believed a radical cure could be obtained by other preferable methods, but never because it failed to cure.

The second proposition is better stated and less open to obvious criticism, but none the less, we believe, an error. The author says:

"After abandoning the ligature I adopted the clamp and cautery. . . . My experience, which exceeded fifty cases, resulted eventually in the conviction that it was decidedly inferior

[1] Brit. Med. Jour., February 26th, 1887.

to the ligature. The immediate risks I found to be greater and the failures by recurrence more numerous. Certainly it was more frequently followed by secondary hemorrhage, and I am acquainted with cases where the bleeding which is reported to have taken place must have been little less alarming after the use of the clamp and cautery than that which occurred in those days when hæmorrhoids were unceremoniously excised and no precautions whatever taken to arrest hæmorrhage. These cases were operated upon by surgeons of recognized repute in this special method of treating piles. I consider that a plan of treatment which fails to compass that special end for which it was designed, and, in addition, has other obvious disadvantages besides the further objection of being somewhat difficult to understand and complex in execution, loses its position in surgery and must give place to other operations which involve less risk, give better results, and do not require any special surgical training."

Looking at this sweeping condemnation a little more closely, we find that the author, with an experience of fifty cases, found "the immediate risks to be greater and the failures by recurrence more numerous" than by the ligature. What immediate risks *he* found he does not state, but he heard of cases of secondary hæmorrhage in the practice of others. What percentage of failures he had he does not state, only that the results were worse than by the ligature. If by this is meant that while he failed in two out of a dozen cases with the ligature, he failed in a still greater percentage with the clamp, his results were indeed bad. How are we to compare his results with those of Allingham and Smith, who number their operations by these two methods by the thousands and never report failures? Smith never speaks of any difficulty in understanding or practising the clamp operation, or of any particular "special surgical training" as necessary for its performance. Indeed, we know of nothing much simpler than to pinch up a pile with a clamp, and, after cutting off a part, burning the stump which remains.

The author does not sufficiently particularize what "immediate risks" he found to be so great. We never have heard of any immediate risk beyond the risk attending the administration of an anæsthetic. Nor does he tell what the additional "obvious disadvantages" were. We will not, however, argue the question. The author tried it and did not meet with success, while other men have practised it for a lifetime and found it perfectly satisfactory and eminently free from all the objections which he raises.

The third proposition is this :

"I do not consider that any surgeon has a thorough conception of hæmorrhoids until he has performed the operation of excision. He may have dissected the *cadaver* any number of times with the special object of studying the structure of hæmorrhoids, but it is only on the living subject that dissection will reveal their true nature. It is these vivisections that have confirmed my belief in the inefficiency of the ligature and clamp, and they have revealed also the cause of failure. In surgical literature we read of hæmorrhoids as distinct individual tumors, but the vivisections I have referred to demonstrate that the entire plexus of veins surrounding the immediate interior of the gut is at fault. Without doubt the hæmorrhoidal condition is marked by special protuberances at certain points in the circumference of the gut, and these, I find, have a pretty uniform position, owing, no doubt, to the regular disposition of the fibrous septa. But the essential fact remains that, though possibly concealed by these masses, there are minute venous radicles behind and between the main tumors."

We interrupt the author's remarks at this point merely to call attention to the fact that he has asserted something which nobody has ever denied—the veins of the rectum anastomose. He goes on to say that these small venous radicles "are now as small as their larger neighbors once were ; but let the latter be removed by clamp or ligature, and the apparently insignificant veinules will dilate and take their place, the very removal, perhaps, affording room for growth, and, whilst taking off external pressure, leaving the tension within increased. It is on the removal of these rudimentary piles that the permanence of the cure and the future welfare of the patient depend."

The calling of a "minute venous radicle" a "rudimentary pile" is, we believe, an entirely new and original pathological idea—very analogous to the assertion that the normal arch of the aorta is a rudimentary aneurism. The whole proposition seems to us rashly stated, unfounded in fact, incapable of proof, and unsupported by the clinical experience of the greatest authorities.

In the first place, the author may argue as he will about the causes of his failures in operating by the two methods he condemns. Other men who have practised the operations longer, and are therefore greater authorities, do not fail ; and with them minute venous radicles do not develop into piles after they have operated. With them the removal of three or four sec-

tions of the mucous membrane with the clamp or the ligature, and the substitution of firm cicatrices for hæmorrhoidal tumors, do not lead to the development of new hæmorrhoids by "affording room for growth," "taking off external pressure," and "leaving the tension within increased."

The question is not one for pathological discussion, or in any sense for argument; it is one of clinical fact. Does the ligature operation or that with the clamp cure, or does it not? On the negative we do not consider Whitehead's experience of twelve cases with the ligature and fifty with the clamp as any offset to the figures of Allingham and Smith. Nor do we believe that those who are practising Whitehead's operation to-day are doing so because they have found the others to be unreliable. Both the ligature and the clamp will cure, but it is possible to imagine something better than either in certain particulars—something that will cause less pain, less confinement to the bed, less sympathetic vesical disturbance, and less danger of surgical accident. This it was hoped carbolic-acid injections would supply, and, this hope proving unfounded, it is natural to try the next thing—excision. If this gave a more permanent cure than the older methods—which it does not—and if it were attended by less subsequent pain and a more rapid recovery—which it is not—it would very soon take their place. Otherwise it will surely give room to the next properly attested method which is brought to the notice of the profession; for if it has no great advantage in its results it will inevitably be carried out of practice by the inherent difficulty of its performance.

The author speaks of the clamp operation as "being somewhat difficult to understand" and as requiring "special surgical training." Its performance by a practised operator is a matter of seconds, not minutes. It is more rapidly done than the ligature, and both can be done in less than a minute—or could be before so much time was devoted to antiseptics. An operation such as these will not be abandoned for an elaborate dissection like Whitehead's until the latter has been proved to be in many ways preferable; and we venture to say that this has not yet been done. Whitehead himself does not give results in sufficient detail to enable us to judge on the points necessary for a decision. He says:

"I have now operated upon more than three hundred patients without a death, a single instance of secondary hæmorrhage, or one case where any complication, such as ulceration, abscess, stricture, or incontinence of fæces, has occurred."

This is certainly a good result, but nothing exceptional, and certainly no better than can be shown by either the clamp or the ligature in other hands than his.

The points upon which the merits of the operation must rest are not that it cures and fails to kill, but the amount of pain and constitutional disturbance it causes. He says "the patient sits up on the fourth day, and is in condition to resume work within a fortnight"; that he rarely finds much pain after the operation, and only occasionally uses the catheter. These are also good results, but not exceptional or confined to his method.

On these points Weir[1] has given some more accurate data from an experience of six cases.

As the cases are well and clearly reported, we take this opportunity for examining them, and through them the results of the method, rather closely.

Regarding the first, it is stated that much less pain was experienced after the operation than is often observed after the operation of ligation; that on the eighth day the line of suture was completely healed, and a week later the patient was discharged from the hospital perfectly well, with a clean and well-shaped anus, only two sutures remaining attached to the skin, and these causing no trouble.

In the second case the patient urinated voluntarily after the operation, the bowels moved without pain on the seventh day, and he was walking about on the twelfth. The stitches were removed, and he was discharged on the eighteenth day.

In the third case the patient suffered a good deal of pain after operation, and the urine had to be drawn once, perhaps; however, both these facts may have been attributable to the increased stretching and manipulation of an examination for a possible stricture. The bowels moved painlessly on the seventh day; on the eighth the wound was found to have united primarily, with the exception of a small area; and on the thirteenth day he was up and about.

In the fourth case there was no reaction whatever after operation, there being no pain and the urine being passed voluntarily. He was sitting up in bed on the third day, and about on the sixth. The majority of the sutures were removed on the tenth day.

In the fifth case these particulars are not given, but in the sixth the patient was catheterized during the first twenty-four hours; the subsequent progress was painless; the patient was

[1] The Medical Record, July 14th, 1888.

able to sit up in bed squarely on the affected part at the end of the third day, and was dressed within a week.

Weir compares these results very favorably with those of the ligature method, and, we think, with perfect justice. The recovery is quick, and the reaction, as shown by pain and difficulty in urination, is less. But with regard to the clamp and cautery method the same certainly is not true. It is now many months since I have used the catheter after an operation for hæmorrhoids—so many that I do not know if I possess such an instrument; and a case in which the patient is not able to report at my office in a week after operation is an unusual exception. Indeed, I have difficulty in keeping my patients under observation after the first week.

For exactly the reasons that Weir prefers Whitehead's operation to the ligature I prefer the clamp to both. All three of them give the same satisfactory results in the end, but the clamp and the method by excision cure with less pain than the ligature, and the clamp operation is much simpler than that of excision, while possessing all its advantages.

In addition to the objections which have already been formulated to Whitehead's operation I wish to add one more. The success of the operation depends entirely upon securing union of the adapted surfaces by first intention. Failure in this means bad stricture of the rectum; and failure to get union by first intention is nowhere more common than in this part of the body. A sufficient number of these cases are now on record in the practice of the best hospital surgeons in New York to render this operation one of doubtful propriety while we have so many more reliable ones as we now possess. It is true that stricture may follow either the ligature or the clamp, but in the nature of these operations, consisting, as they do, in the removal of successive segments of mucous membrane, sufficient strips of normal tissue are almost always left to prevent this accident, and a good operator will take especial pains to preserve enough mucous membrane to prevent closure of the anus by cicatrization. In Whitehead's operation the whole mucous membrane is dissected up and amputated, more being brought down from above to take its place. If this holds, all is well; if it fails to unite by first intention, there is a wide ulcer completely surrounding the anus, and a stricture is the necessary consequence. The slight stricture which may result from either the ligature or clamp operation is easily curable by suitable treatment.

I have also recently seen a case which illustrates another dan-

ger of this method, and one which I had not thought likely to occur. The patient, a woman aged thirty-five, was operated upon eight months ago in one of our city hospitals for hæmorrhoids by Whitehead's operation. The anus now presents a peculiar appearance, at first sight resembling a slight but complete prolapse. The incision in the operation had been widely outside the muco-cutaneous junction; the mucous membrane had been drawn down to meet it and had united by first intention. Result: a ring of excoriated mucous membrane, in half of its extent fully an inch wide, surrounding the entire circumference of the anus, and ending, without any shading off, but suddenly and abruptly, in healthy skin. The woman suffers greatly, and I see but one thing to be done. I shall dissect up the mucous membrane till a point is reached inside the anus; amputate it, and leave the wound to close by granulation over a bougie. The result will be a stricture of the anus, but one which I think can be controlled; and a much less severe condition than the present one, which will certainly end in extensive ulceration and its attendant evils.

CHAPTER VIII.

PROLAPSE AND INVAGINATION.

Of prolapse of the rectum and invagination there are four distinct varieties.

1. *Prolapse of the Mucous Membrane Alone.*—This, which is sometimes spoken of as "partial" prolapse, because only a part of the wall of the rectum is involved in the descent, is well represented in Fig. 95.

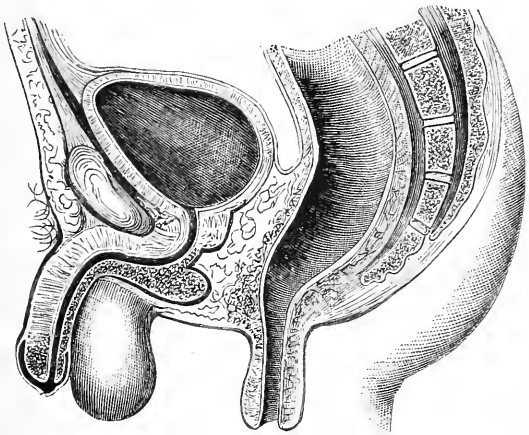

Fig. 95.—First Form of Prolapse. (Mollière.)

2. *Prolapse of all the Coats of the Rectum, including, when the disease is of sufficient extent, the Peritoneum.* (Fig. 96.)

3. *Prolapse of the Upper Part of the Rectum into the Lower, or Invagination.* (Fig. 97.)

4. *Invagination in the Continuity of the Intestine.*—The same condition as the third variety, only occurring in a part of the bowel further away from the anus.

The first form is a mere everting of the mucous membrane of the lowest portion of the rectum, rendered possible by the laxity of the submucous connective tissue. It is seen as an accompani-

ment of old cases of hæmorrhoids, and its mechanism may be studied at any time upon the horse, in which it occurs naturally at the close of each act of defecation.

The second variety is an exaggeration of the first, in which, after the submucous connective tissue has yielded to its utmost, the whole thickness of the rectum begins to descend, and finally

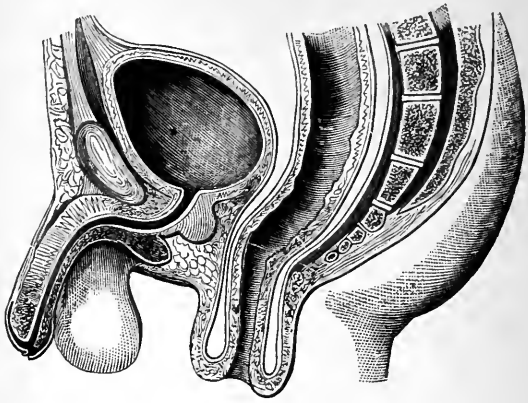

Fig. 96.—Second Form of Prolapse. (Mollière.)

protrudes. It follows, of necessity, that after this protrusion has reached a certain length the peritoneal coat must also descend outside of the body, and this condition is shown at a glance by reference to the plate.

In both of these forms the protrusion begins first at the part of the rectum nearest the anus. In the third form, the part of

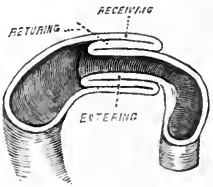

Fig. 97.—Third Form of Prolapse. (Bryant.)

the rectum higher up is passed through that nearer the anus, and what is known as an invagination occurs. This condition must, of necessity, cause a sulcus or groove to exist between the containing and the contained portion; and at the bottom of this sulcus the mucous membrane of one is directly continuous with that of the other. The depth of this sulcus must depend

upon the point at which the invagination occurs, but in the variety under consideration its bottom can generally be felt by introducing the finger by the side of the protruding portion. (Fig. 98.)

In the fourth variety this sulcus also exists, but its bottom cannot be felt, the point at which the invagination has occurred being in the continuity of the bowel, too far away from the anus. This is known as intussusception, and is shown in Fig. 97. In the first three forms of the disease there is always a protrusion of a portion of the bowel through the anus; in the fourth there may be no such protrusion, the lower end of the invaginated bowel being still within the rectum, or perhaps too far up the canal to be seen or felt.

Having thus briefly defined the different varieties of prolapse and invagination, we shall consider each one in detail.

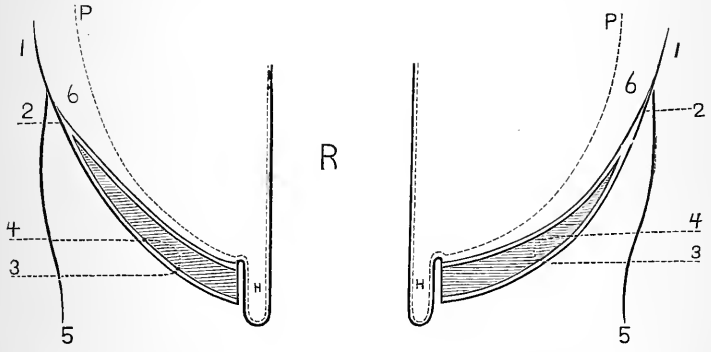

FIG. 98.—Showing the Commencement of the Formation of the Hernial Sac. H, Hernial sac lined by peritoneum and composed of all the coats of the rectum.

Prolapse of the Mucous Membrane Alone.—This is perhaps the most common of all the varieties of the disease when we take into consideration its frequent coexistence with hæmorrhoids. It is found in children most often between the years of two and four, and in adults it is more frequent in women than in men. Its causes are various. Among them may be enumerated the following: *a.* Those which tend mechanically to draw down the mucous membrane, such as hæmorrhoids, polypi, vegetations, and tumors. *b.* Those which tend to weaken or to destroy the action of the sphincters, such as ulcerations or incisions. *c.* Those which cause muscular spasm, such as fissures, worms, dysentery, phimosis, cystitis, calculus, stricture of the urethra, and enlarged prostate. *d.* Those which produce permanent dilatation and weakening of the sphincters, such as

spinal paralysis, traumatism, chronic constipation, and sodomy. In this last connection Mollière [1] details a very interesting case from his personal observation in a woman suffering from vesico-vaginal fistula. Her husband, a brutish peasant, not daring to practise coitus in the ulcerated vagina of his wife, subjected her to unnatural intercourse daily for more than a year, with the result of producing a relaxation of the sphincter which showed itself by prolapse to an enormous extent and by incontinence. To this lack of tonicity of the sphincters may be attributed the frequent occurrence of prolapse in feeble and badly nourished children. *e.* Those which produce œdema and swelling of the pelvic tissues, such as pregnancy, parturition, fæcal accumulations, and hepatic lesions. In this connection also Mollière [2] details an instructive experiment which may easily be repeated on the cadaver. He says: "On the cadaver of a young girl I introduced under the mucous membrane of the anus a blowpipe and fastened it with a ligature. By practising insufflation the air instantly spread in the submucous rectal tissue, and the mucous membrane escaped from the anus. I repeated the same manœuvre at another point of the circumference of the anus, with the same result. By dissection I was able to assure myself that only the mucous membrane had been raised up. It was then sufficient in this case to cause tumefaction of the submucous tissue to produce prolapse; and, moreover, in this subject the anus was still firmly closed." *f.* To these causes it may be proper to add one anatomical one—the undeveloped sacrum in children, which, by its straightness, leaves the rectum comparatively unsupported.

Symptoms.—The first form of prolapse generally comes on gradually and seldom suddenly. It may be partial or complete as regards the circumference of the anus, being in some cases of hæmorrhoids confined to one side of the aperture, and in others involving the whole circumference. It presents itself as a scarlet or livid mass (depending upon the state of contraction of the sphincter) projecting from the anus, covered with the natural secretion of the bowel, directly continuous with the skin on one side and with the mucous membrane on the other, and arranged in folds which radiate from the central aperture toward the circumference. It is at first spontaneously reducible, or at least easily replaced by a slight pressure, and remains reduced till the next act of defecation; but as the amount of pro-

[1] Op. cit., page 202.
[2] Op. cit., page 199.

lapsed membrane increases, the difficulty in reduction becomes greater. At first also there is no pain, but after a time the act of defecation comes to be greatly dreaded by the patient, and the suffering continues till the tissue is replaced.

Prolapse of the Second Degree.—As already said, the second variety of prolapse differs from the first in the fact that it is composed of the whole thickness of the bowel, and, therefore, when of sufficient length. of peritoneum also. It is probable that every prolapse of more than two inches in length may contain peritoneum ; and it follows from the anatomy of the parts that the peritoneum will extend lower on the front than behind. In the peritoneal pouch thus formed there may be located coils of intestine, an ovary, or a part of the bladder. In this form of prolapse there is no groove or sulcus, as is shown by the figure,

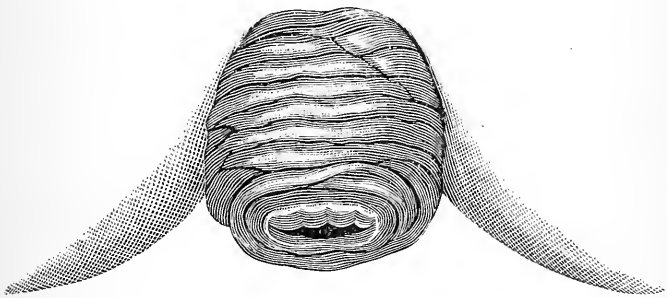

Fig. 99.—Prolapse composed of all the Coats of the Rectum. (Bushe.)

and the absence of such a groove is, therefore, no proof of the non-existence of a fold of peritoneum in the tumor.

It is a mistake to suppose that this second variety is not met with in children, for it is only an exaggerated form of the first, being the next step in the descent after the submucous connective tissue has yielded its utmost ; and exaggerated cases of prolapse are often seen in children. It is distinguished from the first variety, first of all, by its size. (Fig. 99.) The first is never very large ; while the second, from the nature of the case, must be of considerable dimensions. Again, a prolapse of the second variety is generally of long standing. The second generally follows the first, but a prolapse may be of this variety from the beginning, resulting, in such a case, generally from violent straining, and coming on suddenly. The first variety is not firm and thick to the feel ; the folds of mucous membrane radiate from the orifice to the circumference, and the opening

is circular and patulous. In the second the orifice is slit-like and is drawn backward by the attachment of the meso-rectum, or in females forward by the closer attachment to the vagina. The form of the tumor is conical, its walls are thick and firm, and when pressed between the fingers the gurgling of gas in a contained loop of intestine may sometimes be detected, and a resonance may be obtained on percussion.

It will generally be impossible to decide by physical examination whether a prolapse of the second class contains peritoneum or not, unless the case be one of true rectal hernia in which the *cul-de-sac* of peritoneum contains a loop of small intestine or some of the pelvic organs. Such cases are rare, and the only safe rule is to act on the supposition that every prolapse not of the first variety may contain peritoneum, and act accordingly.

If such a tumor be carefully dissected, the coats of the protruded bowel will be found enlarged, the mucous membrane will be seen to be thickened and dense in structure, especially at the free extremity, and it will also sometimes be found eroded and granular. The submucous areolar tissue will be seen to be infiltrated with albuminous deposit, and the muscular layers will be hypertrophied. Owing to these changes, the bowel is actually increased in size and becomes too large to be retained in its proper place; which explains the difficulty often experienced in reducing it and in keeping it reduced, in spite of the constant straining and desire for defecation which it produces. These changes in the mucous membrane may in rare cases result in the production of a foul, hard, bleeding, eroded mass.

The causes of the second variety are the same as of the first and need not again be enumerated. The symptoms also are the same, with the addition of more or less incontinence of fæces in old cases; but the treatment is not the same in all respects, for certain measures which may be safe when a prolapse contains no peritoneum may be fatal under the opposite condition.

A prolapse is apt to increase slowly in size as time advances. In children especially, it may at first cause little apparent discomfort. The bowel is usually replaced by the parent after defecation, and the condition is well borne till more or less inflammation and erosion of the parts set in. Then each act of defecation is greatly feared. After a time the protrusion becomes more frequent and remains down longer, till finally it is down most of the time. Then suddenly a change occurs and

replacement is no longer possible. This will bring the case to the surgeon, and he will find all the difficulties increased fourfold by the existence of one of two conditions—inflammation or strangulation.

When inflammation has occurred, there will be more or less febrile action and constitutional disturbance. The prolapse will be swollen, hard, and painful if the inflammation is in progress; if it has passed off, the tumor will be left larger and harder than before, from infiltration. The mucous membrane will be thickened, and may be eroded or ulcerated, and the difficulty of reduction is greatly increased from the changes which have occurred in the tumor. Strangulation is rare in infants, but may occur where the tumor is large and the sphincter firm. It may be temporary when properly met, or it may result in sloughing which shall involve a whole or part of the tumor. It may result in a cure by sloughing, or it may extend and cause death from peritonitis. When the sloughing involves the whole prolapse, it is also apt to cause a serious stricture. When it involves only the mucous membrane, it may cause just sufficient subsequent contraction to effect a cure. These changes are not apt to occur in the first form of the disease, and are generally confined to the second or third.

The bleeding from a prolapse is not generally a very important matter. More or less of it occurs at stool, but seldom to a serious extent. It is more apt to be a general oozing than a free hæmorrhage.

It would seem that there ought to be little difficulty in diagnosticating this form of disease. The most common error is to treat a child for it and overlook the polypus which is the cause of it; but this is generally the result of prescribing for what the parents call a "coming-down of the bowel," without making any examination, and can hardly be called diagnosis. I have often seen large, prolapsing internal hæmorrhoids described by intelligent physicians as prolapsus, and this arises from a failure to justly appreciate the different nature of the two affections. Both are protrusions of the mucous membrane from the anus, it is true, but they do not resemble each other. They are often found associated, the prolapse being secondary to, and caused by, the dragging down of the internal hæmorrhoids; but even then they may easily be distinguished from each other. One is a new growth composed of connective tissue and blood vessels, covered by mucous membrane, and even when large is definitely and plainly circumscribed and more or less pedunculated. It is not

a part of the natural rectum, but an adventitious formation which may be removed, leaving the rectum much as it was before. Prolapse, on the other hand, is a part of the rectum itself merely misplaced. The mucous membrane is not changed; there is no new element added; it is not a circumscribed tumor, but a more or less voluminous mass of the rectal wall. They resemble each other very little, except that they occupy the same situation and are both covered by mucous membrane.

In adults, an old, eroded, bleeding, and infiltrated prolapse may be mistaken for malignant growth, and I have seen two cases in which the difference could only be made out by most careful examination.

But by far the most important point for the practitioner is to distinguish one form of prolapse from another, and particularly this one from the ones next to be described. Too much stress cannot be laid upon this point, for, although the disease is not at all an uncommon one, its pathological anatomy does not seem to be well understood. To the minds of many one prolapse is still very much like another, except that there may be a difference in size, and therefore in the amount of surface to be cut off or painted with nitric acid; and until this idea is thoroughly eliminated there will still be an occasional case, not reported, in which it has borne its fatal fruit in the way of treatment. When it once begins to be understood that putting a clamp or knife to one of these protrusions may involve all the risks which would follow the ablation of an inguinal hernia, a great advance will have been made.

Treatment.—The first step in the treatment of prolapse of the rectum to which the surgeon will be called to attend will generally be to effect the reduction of the mass; after this has been accomplished the treatment may be either palliative or curative. In children a prolapse may generally be reduced by laying the patient across the lap on its face and making gentle pressure on the protruded bowel with the fingers, which have been well oiled, or with a soft greased rag. If this cannot be accomplished by a gentle taxis and without bruising the parts, the child should at once be etherized and a curative procedure adopted. It is scarcely worth while in a child to stop to try the various methods of reduction which have been recommended, where the taxis has failed, before resorting to this step.

In an adult, however, ether and operative interference may both be declined, and the surgeon may have to tax his brain to accomplish the reduction without the aid of an anæsthetic. In

such a case, after gentle taxis has been tried with the patient in the knee-elbow position and failed, cold should be applied while the patient remains on the face in bed with a pillow under the pelvis; and this may be alternated with warm poultices and with plentiful applications of an ointment composed of equal parts of ext. of belladonna and ext. of opium. By these means, the most effectual of which is position, reduction may almost always be accomplished. When by the action of the sphincter the prolapse has become gorged with blood and œdematous, the surgeon is often tempted to resort to leeches. They will generally give relief, and may greatly facilitate reduction, but they are not free from the danger of a concealed hæmorrhage within the rectum after the prolapse has been replaced. Attempts at manual replacement must not be carried far enough to bruise the parts or set up inflammatory action.

The palliative treatment is directed entirely toward diminishing the frequency and the amount of the prolapse, and in children a cure may sometimes be obtained by these means without resorting to surgical interference. The act of defecation is first to be regulated, and should be performed with the patient in the recumbent posture in bed, or while standing. One buttock may also be drawn aside so as to tighten the anal orifice, with advantage; and any source of irritation which produces frequent defecation and straining in the act must be removed. After the action of the bowels, if the prolapse has occurred, the bowel should be thoroughly washed with cold water and a solution of alum (ʒ i. to ℥ viij.) before it is returned. Another favorite wash is composed of the tincture of iron, twenty to thirty drops to four ounces of water. The patient should then be confined to the bed for some time, and pressure should be applied over the anus by a pad kept in place by a **T** bandage in the adult, or by a broad strip of adhesive plaster in children, applied so as to draw the buttocks into close apposition.

If any palpable cause for the disease can be found it must be removed. I have cured a bad case in a child by doing away with the irritation caused by pin-worms, just as I have cured hæmorrhoids by operating for phimosis. Calculus, phimosis, constipation, worms, and polypus must all be remedied if they are present.

After the bowel has ceased to come down with the act of defecation, an astringent injection may be given every night with advantage and allowed to remain in all night. The general

health should be carefully attended to ; tonics should be administered where they seem to be indicated ; and if well borne, cod-liver oil may be used to fulfil the double indication of tonic and laxative. In children these measures may, as has been said, be curative, and, in fact, the disease often ceases spontaneously at about the time of puberty ; but in adults they are not at all likely to be so.

After inflammation or partial strangulation has once occurred, unless it has worked a cure by sloughing, it is almost useless to hope for a cure by palliative treatment. The conditions have become changed ; the tumor is thickened and increased in size ; it has become too large for its former natural position in the pelvis, and acts as a constant source of irritation.

Should radical operative treatment be decided upon, there are several effectual methods, each of which has its supporters and advocates. There is, in fact, one principle which lies at the foundation of the treatment of prolapse by operation. If the tumor be easily reducible, it may be retained in the body by diminishing the size of the anus. If it be not easily reducible, a part of it may have to be removed, the remainder reduced, and then the anus diminished to retain it. All plans of treatment are directed toward the accomplishment of one or both these things, and it remains only to choose between them.

In cases combined with internal hæmorrhoids, the operation for the removal of the latter by either the clamp or ligature may easily be extended so as to cure at the same time the former condition. In such a case the proper course to pursue is to divide the prolapse into several sections with the scissors, and operate upon each one exactly as though it were an internal hæmorrhoid. Caution must be exercised as to the amount of tissue removed, lest too great a degree of cicatricial contraction result.

Since beginning the use of injections in the treatment of hæmorrhoids, I have also in some cases effected a cure of this form of prolapse by the use of carbolic acid in the same way as for piles. The idea of using carbolic acid for this purpose is, I believe, my own, and came naturally from my trials of the remedy in hæmorrhoids ; but both strychnine and ergot have been used for the same purpose for some time. The acid should not be used stronger than a ten-per-cent solution.

At a meeting of the Therapeutical Society, December, 1879, reported in the *Gaz. Hebdom.*, January 2d, 1880, Dr. Ferrand related the case of a lady who had suffered three years from pro-

lapse, the tumor being nearly the size of the fist, and descending even when she walked across the room, and causing great suffering. One gramme and twenty centigrammes of a solution composed of glycerine and water āā fifteen parts, and alkaline hydrated extract of ergot two parts, was injected into the ischio-rectal fossa beside the prolapse. Considerable benefit resulted, and three other injections were practised at intervals of twenty days, ten days, and a month, with the result of effecting a cure. The patient was seen after an interval of six months, and it was found that the prolapse was not reproduced even by such exertion as going up several flights of stairs.

Vidal[1] also has recorded three successful cases of cure with ergotine. The first was that of a man, aged thirty-nine, who had suffered for eight years. After five injections of fifteen drops of a solution of ergotine, at intervals of two days, the mucous membrane scarcely protruded at all. After the eleventh injection it only came down during defecation and returned spontaneously. The whole number of injections was twenty-two, and the man remained perfectly well four years after. The second patient, a female aged sixty-four, was cured after twenty-four days' treatment, and remained well two years and a half after. The third patient, a female aged forty-five, was cured in fifteen days by six injections of twenty or twenty-five drops each. The solution used consisted of fifteen grains of Bonjean's ergotine dissolved in seventy-five minims of cherry-laurel water. The injections were made at the distance of one-fifth of an inch from the anus. Acute pain always followed, and contraction of the sphincter lasting several hours. Several times an injection of twenty-five drops of the solution caused spasm of the neck of the bladder and retention of urine. In no case did the injections produce any local inflammation or abscess. Dr. Vidal has more recently expressed himself as preferring Yvon's solution of ergot to Bonjean's ergotine, as causing less pain.[2]

The danger to be avoided in this method of treatment is the use of too irritating solutions, or solutions in too great quantity, which shall excite a suppurative action and produce constitutional poisonous effects.

Cauterization.—In children in whom milder measures have failed, a very effectual means of cure is the application of fuming nitric acid to the mucous membrane of the prolapsed part.

[1] Paris Médical, August 28th, 1879.
[2] Gaz. Hebdom., January 2d, 1880.

The bowel should first be carefully wiped off with a towel or sponge, and the acid then applied by means of a small stick all over the mucous membrane, but not at all to the skin adjacent. Ether is not necessary, and after such an application the bowel should be replaced, a pad of lint firmly applied over the anus by means of broad strips of adhesive plaster, and the bowels confined by means of opium. Stuffing the rectum with wool causes unnecessary irritation. After three or four days the straps may be removed and the bowels moved with castor oil. In a large proportion of cases the cure will be found complete, though in a few cases I have seen a return of the disease after a few months. In any case, however, the benefit will be found to be very great, and should the disease return a very careful search should be instituted for some existing source of irritation, such as polypus, phimosis, or calculus. In case of a recurrence a second application will be effectual in causing a cure.

This treatment, though successful in children, is by no means so in adults. Deep sloughs may occur in old persons with debilitated constitutions; and as a result of such a slough there may be severe hæmorrhage. Stricture of the rectum may, without doubt, be caused by too free use of this remedy, but since it follows its abuse and not its proper use in appropriately selected cases, it can hardly be considered an objection.

Linear Cauterization.—In adults this is undoubtedly the best means at our command for dealing with this affection, and the best means of applying it is that recommended by Van Buren, with Paquelin's cautery.

The patient is first etherized and placed in Sims's position. Van Buren reduced the prolapse, and applied the iron with the aid of a speculum, though the iron may be first applied and the tumor reduced afterwards. In either case from three to six vertical stripes should be made upon the mucous membrane, with the iron heated to a dull-red heat. The cauterizations should begin about three inches up the rectum, and end at the junction of the skin and mucous membrane. They should also be deeper at the end, where there is no danger, than at the beginning, where the bowel may be perforated. Van Buren recommends that the iron be bent at a right angle a short distance from the end, so that it may be the more thoroughly applied to the concavity of the rectum, and that in mild cases a small iron should be used, "no thicker than an ordinary probe." (Fig. 100.) Allingham, in bad cases, burns through the sphincter muscle at two opposite points, after reducing the

bowel, and inserts a small pledget of oiled wool. By this burning through the sphincter the patulous condition of the anus is overcome. The result of the operation is to decrease the circumference of the anal orifice, and in this way to effect a cure. The patient should be confined absolutely to bed till the wounds are entirely healed, so that a recurrence of the descent may be effectually avoided.

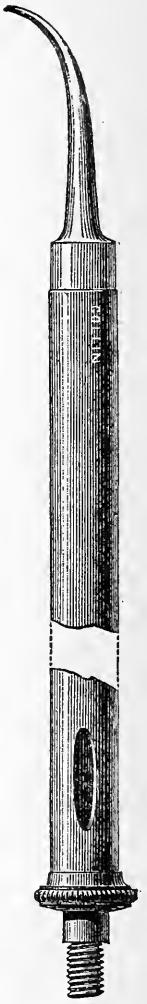

Fig. 100. — Sharp-pointed Cautery Iron.

For some time after the healing, and after the patient is allowed to be up and about, in fact until the full effect of the operation has been obtained, a bed pan should be used. The first operation, if thoroughly performed, will probably result in permanent cure. Should it not, it may be repeated. The only danger in connection with it is the occurrence of secondary hæmorrhage when the sloughs separate, and of primary hæmorrhage from large veins at the time of the application of the iron. To avoid this, Allingham recommends the choosing of points for cauterization which are free from large venous pouches, such as may be visible on the surface of the tumor.

In old cases of extensive disease the operation as thus described may not be effectual, and it may be necessary actually to produce a stricture at the anus to prevent recurrence of the trouble. There is, perhaps, no better means of accomplishing this than to apply the iron to the whole circumference of the anus circularly instead of in longitudinal stripes; but such an operation will seldom be called for.

There is another method of dealing with this affection which, though not as simple as the cautery iron alone, is more effectual, and that is Smith's operation with the clamp and cautery. We have already given a figure and description of the clamp and the operation in speaking of hæmorrhoids, but the operation is even better adapted to cases of prolapse than to hæmorrhoids, the mass being larger and more readily seized, cut off, and cauterized in longitudinal sections.

The moment we begin to think of cutting off a prolapse we approach the danger line. Cauterization is almost never followed by any bad results, unless it is carried to an unnecessary

extent which subsequently produces a stricture; but amputation even of a part of an apparently innocent tumor may be fatal from a wound of the peritoneum, hence the necessity for the care in diagnosis already insisted upon. A prolapse consisting of the mucous membrane alone may be amputated *in toto* without danger; one of the second class must be approached very cautiously, and the operator need not be greatly surprised if he unexpectedly opens the peritoneum.

The operation is simple in its actual performance, but much judgment and experience are necessary to decide how much tissue to remove. A great deal of subsequent contraction must be allowed for, and a troublesome stricture may easily be produced. It will generally be sufficient to remove two or three longitudinal strips, and perhaps to then burn through the sphincter in a couple of places. The part to be removed is seized in the clamp, which is thoroughly screwed up, and cut off with scissors. A considerable stump must be left, and this must be thoroughly burned with the cautery heated to a dull red. If the iron be white the danger of bleeding is increased. After the iron has been thoroughly applied to every part of the cut surface, the clamp may be relaxed, but should not be removed till it is evident that there is to be no bleeding.

If there is a spouting vessel when the clamp is loosened, it should be screwed up again and the point touched once more with the iron. When the clamp is finally removed, the burned surface should be thoroughly dry.

After such an operation, what is left of the tumor should be reduced, if possible, and the pad and bandage applied as after linear cauterization. In case the tumor is still too hard and swollen to be reduced, even after the operation, it must be dressed with a cold compress, and the case left until the shrinkage which is sure to follow has taken place. After this operation the treatment is somewhat different from that after the simple linear cauterization. In the latter the tumor still exists, and care must be taken to prevent its coming out of the body by confining the bowels. After the clamp has been used, it is generally better to encourage the bowels to move after the second day by the administration of a saline or the compound licorice powder. If the opposite course be followed, and the bowels be confined for a week or ten days, great pain will be experienced at the first movement.

The suffering after this operation is not generally very severe. No dressing of the wound is required except frequent

washing with warm water and the application of a soft cloth to the parts to catch the discharge which escapes from the anus. The patient should be kept in bed till the wounds are entirely healed, and for the first few days the surgeon must inquire carefully after the action of the bladder. All things considered, the operation is a very satisfactory one, much more so than the analogous operation of removing sections of the tumor with the ligature.

Two questions may arise in this connection. Should reduction be tried when the tumor is inflamed, and should it be tried in case of a circular slough? In answering the first question, the distinction must be made between a prolapse which is merely strangulated and one which is inflamed. The appearances may be much the same, but an old prolapse in an old person when found in this condition is much more apt to be inflamed than strangulated, for the sphincter muscle in such cases has generally lost the power of forcible constriction. The danger in returning an inflamed prolapse into the body is that the inflammation may extend and cause general and fatal peritonitis; and, as a rule, it is safer not to employ the taxis in such a case, but to put the patient in bed and treat it by local applications and rest till the acute symptoms have disappeared.

The occurrence of a circular slough as a result of strangulation is a very serious complication. The tumor is generally of the second variety, has become first irreducible, then inflamed, and finally strangulated. At the apex, around the opening, there will be seen a black ring of dead mucous membrane and connective tissue of greater or less extent, perhaps already partially separated and hanging in shreds. The patient will exhibit more or less constitutional disturbance and fever, with fretfulness and evident suffering.

The gravity of this condition consists in the fact that a circular slough is very apt to be the cause of a severe stricture after cicatrization has occurred. If the prolapse be a long one, and the slough is at its apex three or four inches from the anus, the stricture will be at a corresponding distance up the rectum when it is reduced; and its extent and severity will be in proportion to the amount of tissue which has been involved both longitudinally and in depth.

The treatment of this complication resolves itself into the relief of the strangulation and the subsequent ablation of the tumor. The former is best done by rest, the avoidance of taxis, and the use of antiseptic poultices. This part of the treatment

may be extended over two or three weeks until the acute symptoms have subsided. During this time the patient will need constant care, both locally and constitutionally. The tumor may be removed with the clamp as already described, or by means of the elastic ligature. In this way the future stricture is removed by the ablation of the affected part, and whatever future contraction there may be resulting from the operation will be at the anus, where it is easily handled, and not at a point within the rectum.

The dangers are easily understood to be hæmorrhage, hernia of the intestines through the incision, and peritonitis. Each may be avoided where the surgeon is prepared beforehand for their occurrence, and Mollière[1] relates one case where the operation was performed by himself with the hot iron, but the patient "died on the eighth day from the effects of the chloroform," so that he was unable to decide on the value of the operation.

Excision with the surgeon's eyes open to the fact that he is dealing with peritoneum may be done with success under such circumstances. At all events it is a very different matter from excision of this variety of prolapse under the impression that it is the one previously described and contains no peritoneum.

Dr. Kleberg has utilized the elastic ligature in operating upon severe cases of prolapse; and it may be that, if the mass has to be removed at all, the method he describes (page 258) is the preferable one.

Having thus described the most effectual means of dealing with this troublesome affection, it is scarcely worth while to describe the various cutting operations by which pieces are removed either from the mucous membrane alone or from the sphincter muscle, with the object of accomplishing the same result that is more readily attained with the cautery iron. Dupuytren's operation consisted in removing three elliptical folds of skin and mucous membrane from the verge of the anus. The same idea has been more recently applied in Germany.[2] Robert and Dieffenbach cut out wedge-shaped pieces, and approximated the edges with deep sutures; and the latter even went so far as to cut off the whole tumor.

In cases in which curative measures are out of the question, the hæmorrhages and the erosions may be relieved by suitable

[1] Op. cit., page 240.

[2] "Eine neue Methode der Operativen Behandlung des Mastdarmvorfalls," Deutsche Med. Woch., No. 33, 1880.

applications, rest in bed, defecation in the recumbent posture, etc. Subsulphate of iron is perhaps as good an application to the bleeding surface as any other; and weak solutions of nitrate of silver often have a good effect upon the erosions. The reduction of a prolapse of the second degree is by no means as simple a matter as that of the first. When the sphincter is tight and the tumor œdematous, it may be nearly impossible; and in old cases, where the opposite condition of the sphincter obtains, it may be equally difficult to keep the parts within the body after placing them there. The latter may, however, generally be accomplished by the means already enumerated, and the reduction in obstinate cases may generally be obtained through the influence of anæsthesia.

Third and Fourth Varieties.—These two forms of invagination will be described together because of the fact that they differ from each other not at all in their nature, but only in extent and location. It will be observed that the word prolapse is now dropped and invagination substituted, which more aptly expresses the condition. The essential difference between the disease now to be considered and the forms already described, consists in the fact that while in the latter the bowel begins to slip down from its lowest portion at the anus, in the former the lowest portion at the anus remains in its proper position and the bowel from above is telescoped within it. Under these circumstances it is evident, as is shown in Fig. 97, that the affected portion of the bowel must consist of three different and distinct cylinders—an outer one, which contains the other two, and two included portions, one of which is the entering and the other the returning bowel.

When the upper part of the rectum becomes invaginated in this way within the lower, the included portion will not always appear at the anus as in the cases of prolapse already described. This is a rare form of disease, and one which I first saw described in print by Cripps. I have myself met with it but twice. The symptoms are peculiar, and are yet almost diagnostic if the patient be sufficiently intelligent to make himself understood. The thing most decidedly complained of is a peculiar straining and difficulty in defecation. The patient will say that when he strains the bowel seems to become closed, and that no amount of effort will overcome the obstruction: that to have a passage he has to assume an unnatural position. One of my patients could only relieve himself in the knee-elbow position, and the other only when lying down. When this history is

given and a digital examination shows an absence of any change in the gut, such as stricture, a temporary invagination at the time of defecation may be strongly suspected. It is possible in some cases to feel the tumor caused by the condition in the rectum when the patient assumes the natural position of defecation and strains down. The treatment adopted by Cripps in his case I have also used in one case successfully. This consists in linear cauterization of the upper part of the rectum. The iron should be an old-fashioned, olive-pointed, actual cautery iron with small tip, heated scarcely more than black, and

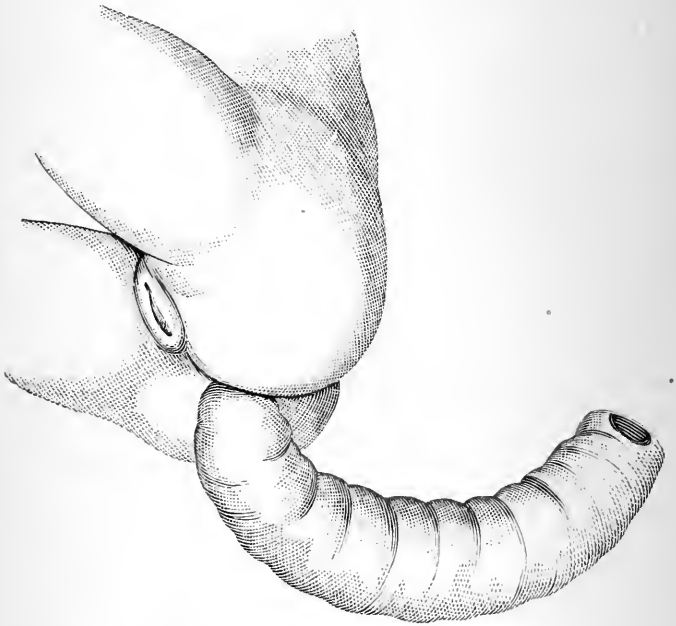

FIG. 101.—Prolapse of Invaginated Intestine. (Esmarch.)

applied lightly at four or five points. The thermo-cautery is too powerful an instrument, for it must be remembered that the peritoneum is just under the iron.

When the invagination is of sufficient extent, a distinct sulcus may be felt by the finger between the extruded portion and the mucous membrane which is continuous with that of the anus. The bottom of this sulcus, or the point at which the entering portion becomes directly continuous with that into which it enters, may also be felt by the finger if it is low enough down; if not, it may sometimes be detected by the aid of a soft catheter.

This is what is understood by the third variety of prolapse. When a portion of the bowel still further removed from the anus has become invaginated into that immediately below, the included portion may or may not descend sufficiently near to the anus to be felt by rectal touch, and the sulcus may not be apparent. This constitutes the fourth variety, or what is now generally known as intussusception. It is evident that between a case of prolapse in which all the coats of the rectum appear through the anus, and in which a sulcus can be felt by the finger passed around the protruded portion, and a case in which the ileum is telescoped through the ileo-cæcal valve and appears at the anus, the difference is one of degree and not of kind.

Such a protrusion as this is evidently composed of an entering and returning portion of the bowel, each in its whole thickness,

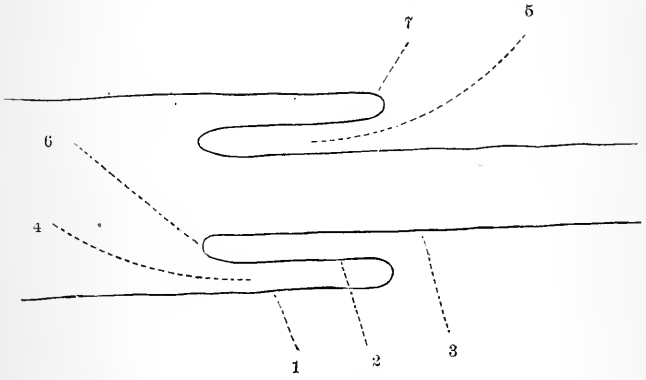

FIG. 102.—Intussusception.

and between them there are two surfaces of peritoneum in apposition, one covering the descending and the other the ascending portion. The peritoneal *cul-de-sac* thus formed is generally empty; if there has been sufficient inflammation, the serous surfaces may have become united to each other.

The diagnosis of this form of prolapse rests chiefly upon the presence of the *sulcus;* and this is the first point to be determined in the examination of every case. The size is of little value in the diagnosis. An inch of rectal mucous membrane may protrude in the first form, or an inch of the ileum may protrude in the third, and at first sight they may appear very much alike. A large, cocoanut-shaped tumor is generally of the second variety, while a very long one is more apt to be of the third. An intussusception in the course of the intestine at a distance from the anus is not likely to project more than a few inches outside the body.

The sulcus merely proves the fact of invagination; but when we consider that the ileum projecting through the anus has been mistaken for cancer, polypus, and hæmorrhoids, that it has been cauterized, incised, and cut off, and that these errors in diagnosis have led to fatal results, its importance can hardly be overestimated.

In Fig. 102 is shown a diagram of an intussusception anywhere along the length of the gut. The conditions are essentially the same.

There is the ensheathing part, 1; the entering portion, 3; and the returning portion, 2, which must be carefully distinguished from each other. The former (1) is sometimes spoken of as the intussuscipiens, and the other two combined as intussusceptum. Within the sulcus (4) two mucous surfaces are in contact with each other, and within the sulcus (5) two serous surfaces. The point (6) where the entering portion (3) becomes the returning portion (2) is known as the apex of the intussusception, and the point (7) where the returning portion joins the sheath is the neck.

Of this condition there are many varieties and degrees. The most common, forming nearly one-half of all the cases, is the ileo-cæcal, or that in which the ileum and the cæcum pass into the colon, carrying the ileo-cæcal valve at the apex. This variety also is the most extensive, the cæcum sometimes passing the whole length of the colon and protruding from the anus. The next most frequent form is that which is confined to the small intestine; more frequently to the lower part of the jejunum, but quite often to the ileum, and occasionally to the duodenum. In these the amount invaginated is generally short and the tumor correspondingly small. After these in frequency come the cases affecting the colon, sigmoid flexure, and rectum. When the large bowel is affected it is most often near its termination, the descending portion passing into the sigmoid flexure, the flexure into the rectum, or the upper part of the rectum into the lower. These latter forms are necessarily limited in extent, for when once the invagination has been fairly formed, and after the entering portion has been grasped, the increase in length is always at the expense of the sheath. The apex (Fig. 102) remains constantly the same, and the turning-in is not done at this point, but at the neck. If, therefore, the neck be within the rectum, the intussusception must be limited by the length of the rectum remaining between the neck and the anus, and must be comparatively short.

An intussusception of the rectum or sigmoid flexure will also, as a rule, be straighter and less curved than one of the bowel higher up, because of the absence of the mesentery in the tumor. As the involution goes on at the neck of the tumor, the mesentery is drawn in between the two inner layers, in the form of a cone, with the base upward. The traction upon this causes a curve of the contained cylinder, the concavity of which is toward the attachment of the mesentery. In the small intestine this curve is very marked at times, and the meso-colon may cause the same appearance in cases involving the large bowel. The traction of the mesentery causes, also, other changes. The axis of the contained portion is not the same as that of the sheath, and the orifice is drawn into a slit-like shape and turned against the side of the sheath, so that it may be difficult to detect it with the finger. The curve of the inner portions may be so sharp as to cause complete obstruction, and the pressure upon the sheath may be so great as to cause sloughing and perforation. This is, indeed, the chief cause of the obstruction which results from intussusception, though the obstruction may not become complete until some indigestible substance has been propelled into the already narrowed passage, or until the lumen becomes almost completely closed by a gradual thickening of the different layers of the gut, due to congestion and inflammatory exudation in their walls.

The obstruction, and the strangulation which is generally present to a greater or less degree, cause certain other changes. The bowel above the implicated portion may be simply distended and congested, it may be filled with a large mass of fæces, or it may be ulcerated and perforated. If the case has been acute, death may supervene before any of these effects are noticeable; if chronic, there may be more or less thickening from infiltration.

The serous surfaces in apposition in the two contained portions are apt to become united by adhesions due to peritonitis. These may be found at any part of the intussusception, and may vary much in extent. There may be only a few bands near the apex or neck, or the two surfaces may be completely agglutinated.

The adhesions may appear at any time after the third day, may be extensive in an acute case or absent in a chronic one, and there is no regularity in the time of their appearance or their extent. When present they are the chief obstacle to reduction, whether spontaneous or the result of any kind of treatment.

The strangulation of the contained portion may cause in it certain other changes. The walls may become much swollen by the transudation of serum, the peritoneum congested, the mucous membrane infiltrated; blood is effused between the mucous surfaces of the outer and middle layers, and the whole contained portion becomes in this way irreducible. Should the strangulation be sufficiently severe, gangrene may supervene upon this condition. This is nature's method of cure. It is more apt to take place in acute than chronic cases, and may involve the whole or only a part of the contained portion. As a result many feet of bowel may slough off and be passed in cylindrical form, or only small portions of mucous membrane may be discharged. In one case there is reason to believe that about four yards came away, piece by piece, *per anum*.[1]

The disease is twice as common in males as in females, and is greatly more common in children than in adults. More than one-half the whole number of cases occur in children under ten years, and of these nearly one-half occur before the age of one year. In adults the trouble will generally be found to involve the small intestine; in children, the large.

Strangulation is much more frequent where the outer layer is composed of the small than where it is composed of the large intestine, because of the greater tightness of the constriction. In the latter case the congestion may be only moderate in degree, and the condition may last many weeks without gangrene or ulceration. This condition is known as chronic intussusception.

If sloughing occur at all, it may happen at any time after the first week; generally, however, it occurs within three weeks, though it may be delayed for a much longer time. In one case the separation of fragments of intestine extended over an interval of three years.

In about one-half of the reported cases a favorable termination has followed spontaneous separation; in the remainder death has occurred after a longer or shorter interval. Several pathological changes may occur. The peritonitis which serves to unite the serous surfaces of the contained portions may become general and cause death. The ensheathing portion may become ulcerated and perforated, allowing of the extravasation of fæces. The ulceration may perhaps be due to the lateral pressure of the end of the contained portion against the side of the cylinder which contains it. Separation by sloughing leaves

[1] Peacock: "Pathological Transactions," vol. xv.

the upper end of the ensheathing portion united with the lower end of the healthy bowel, and results in complete amputation of the contained portion. Extravasation may also occur from a deficiency in this union at the time when separation occurs.

While these pathological changes are going on in the contained portion, the sheath may show comparatively little change beyond some congestion and thickening.

The immediate cause of intussusception is now generally admitted to be an irregular peristaltic action of a segment of the bowel. In cases of polypus it is easy to understand how, in the effort of the intestines, both the tumor and the wall to which it is attached may be forced along; but, except in cases of tumor, the intussusception is an accident of sudden occurrence, dependent upon an interruption of the normal rhythmic action of the intestinal wall. In case a segment of the bowel becomes spasmodically contracted, the enfolding will begin at the point where it joins the normal gut below, and will be caused by the peristaltic action of that part which is below, and not by that above. A contracted segment is not driven down into a dilated part below it by peristaltic action above, but is enfolded by the segment below, and increases at the expense of the lower portion.

In studying the symptoms and diagnosis of this affection, it is best to accept the arbitrary division of cases which has been made into ultra-acute, acute, subacute, and chronic. In the first the patient dies within twenty-four hours. The second covers the cases which last from two days to one week; the third those lasting from a week to a month; and the fourth those lasting more than a month. In acute cases the symptoms will be found to vary somewhat, according to the part implicated, but the attack generally begins with a sudden and violent pain. The pain resembles colic, is intermittent, and may or may not be accompanied by vomiting. If the rectum be implicated, the first symptoms may be tenesmus, bloody passages, and the appearance of the intussusception at the anus. The strangulation and engorgement cause diarrhœa, tenesmus, and bloody passages after a time, whatever part of the bowel is affected. It is rare that the lumen of the gut is so completely closed that no fæces pass.

In about one-half of all the cases a tumor can be felt, and this symptom is more frequent in children than adults. It varies in location according to the part involved; is usually hard and resisting; is more prominent when active peristalsis occurs; and may change its position when the bowel is contracting strongly,

or may be moved by enemata. It is not generally very large, and its size is no indication of the amount of intestine involved. In quite a large proportion of cases, especially in children, it may either be felt in the rectum or seen projecting from the anus. When within the rectum, the soft, velvety feel, the sulcus, and the slit-like orifice into which the finger can be passed present tolerably characteristic signs of its nature. When it projects from the anus, the presenting part is not generally more than three or four inches in length, is conical in form, and its nature may sometimes be diagnosticated by the appearance of the ileo-cæcal valve and the orifice of the appendix vermiformis. This variety of intussusception is more often chronic than acute, and the tumor does not, as a rule, appear at the anus until after the symptoms have lasted from one to three weeks, while in an acute case it may be discovered on the second day.

Vomiting of some kind is a nearly constant symptom of intussusception, but it varies much in character and in the time of appearance. The more acute the case, and the higher up the disease, the sooner will it appear and the sooner will it become stercoraceous. In cases involving the rectum it may never be present, while in those involving the ileum it may be the earliest symptom. Stercoraceous vomiting is rather a sign of complete obstruction than an indication of its location. It is only present in about twenty-five per cent of the acute cases and seven per cent of the chronic, and Treves [1] points out that it has a direct dependence upon the diarrhœa. Where the latter is marked and constant the vomiting is comparatively slight, and *vice versa*. In other words, where the obstruction is not complete the bowels relieve themselves in the natural direction.

In the acute form the constitutional state can hardly fail to attract attention. In young children it is simply one of collapse, and the more acute the case the greater the shock. The ultra-acute cases (those fatal within the first twenty-four hours) are fatal from shock, and are almost always seen in very young children.

In chronic cases the symptoms are all more obscure, as will be apparent from the fact that the condition has been mistaken for almost every form of disease of the abdomen. The course of the disease is irregular, the pain uncertain and often absent for long periods; the passages may be normal at times, alternating with both diarrhœa and constipation, and occasionally streaked with blood; the vomiting is not constant,

[1] "Intestinal Obstruction," etc., page 225.

and fæculent vomiting is rare ; the general condition of the patient is that of one suffering from chronic disease. The end may come from the onset of complete obstruction with the usual symptoms, or simply from exhaustion and the effects of long-continued partial obstruction.

The prognosis in all varieties of intussusception is bad, the general mortality in all forms being seventy per cent.[1] The younger the patient the more acute will be the disease and the greater the mortality. The ultra-acute cases are rare, but are all fatal. The acute cases are very fatal, and especially so in children. The chronic cases are nearly all fatal, and the best results are found in the subacute, or those lasting from a week to a month.

Spontaneous cure may occur in three ways : 1st, by reduction ; 2d, by elimination ; 3d, by the production of a fæcal fistula. Spontaneous reduction is rare, and the diagnosis is always open to doubt. It can only be suspected from the relief which sometimes quite suddenly follows all the symptoms of intussusception ; and it can only happen in cases where the physical changes have been comparatively slight and no extensive adhesions have formed.

According to Treves (whose valuable work on obstructions of all kinds leaves little to be desired) spontaneous elimination occurs in about forty-two per cent of all cases, and is extremely rare in children under two years of age. It is much more common in the variety affecting the small intestine than in any other. Cure by the establishment of a fæcal fistula is so rare as to be almost unknown.

The fact that the intussuscepted portion is sloughing off can generally be made out pretty clearly by the symptoms. If the obstruction has been complete, the passages again appear and are bloody, foul, and marked by small shreds of gangrenous mucous membrane or by large pieces of gut. If the case is to terminate favorably, there will also be an abatement of the worst symptoms, but quite a large proportion of cases die even after elimination has begun, from exhaustion, perforation, or subsequent ulceration.

Diagnosis.—The diagnosis of the fact of intestinal obstruction is by no means always easy, for there are many other conditions marked by pain, vomiting, and constipation, which are its three chief symptoms ; but having accomplished so much, the diagnosis between intussusception and the many other causes of

[1] Leichtenstern: "Vierteljahrsschrift f. d. prakt. Heilk.," Prague, 1873-74.

obstruction is sometimes an impossibility. Under these circumstances the discovery of the end of the invaginated portion in the rectum with its sulcus around it makes everything plain at once.

Moreover, after the existence of intestinal obstruction has been made out in a child it is safe to consider an intussusception as the cause, and act accordingly, examples of other forms of obstruction in them being very rare.

If the patient be an adult and rectal touch throws no light upon the case, the next point is whether the condition be acute or chronic. If acute, the diagnosis will rest between intussusception on the one hand, and volvulus, hernia (either external or concealed), strangulation by bands, obstruction by foreign bodies (generally a gall stone), and peritonitis with perforation, on the other. A few hints are all that can be given to aid at the bedside, and mistakes must be expected. Volvulus generally affects the sigmoid flexure, and the pain is apt to be referred to that spot. It is a disease of adult life and old age. The constipation is absolute, not even allowing of the passage of blood. There is no distinct tumor, and there is apt to be constant tenesmus.

With hernia of any kind, or strangulation by bands, there is likely to be a history of former attacks of peritonitis or of obstruction in eighty per cent of the cases (Treves). The onset is sudden, the pain and vomiting very severe, the constipation is complete, except what matter may come from the intestine below the disease, and no blood is passed.

Gall stones large enough to cause obstruction are very rare. The history of previous ones passed will be of great help, as will also the history of previous hepatic colic, or acute obstruction relieving itself.

Duplay[1] has called attention to the fact that a peritonitis from perforation may cause all the symptoms of an acute occlusion, and has given the chief points in the diagnosis of that affection. In peritonitis the vomiting seldom becomes fæcal, but remains bilious to the end; the constipation is less marked, and the patient generally passes gas and liquid fæces or small quantities of solid matter; the tympanites is also less marked, and the coils of intestine are less pronounced; the pain begins with great severity at one point, and extends over the whole abdomen (the same thing may happen in acute obstruction, but in

[1] Duplay: "Du Traitement chirurgical de l'Occlusion intestinal," Arch. Gén. de Méd., December, 1879.

such cases the other symptoms—fæcal vomiting, absolute constipation, absence of the passage of gas *per anum*—are all equally severe, while in peritonitis they do not correspond in severity with the intensity of the pain) ; the temperature is elevated in peritonitis, and normal, or even less than normal, in obstruction.

In chronic cases the diagnosis rests between intussusception on the one hand, and stricture of the intestine (from any cause either within the gut or from pressure without), fæcal impaction, and gall stone on the other.

Stricture may be detected by the use of a bougie ; failing this, a cancerous mass may be felt, and the history will point to long-standing ulceration with the usual symptoms. A tumor pressing upon the gut can often be made out by careful examination, especially through vagina or rectum. Fæcal impaction may be felt through either the rectum or abdominal wall, and the tumor is generally characteristic. A gall stone passing slowly along the small intestine, causing a chronic obstruction, must be diagnosticated by the rules given for detecting it when causing acute obstruction.

It will thus be seen that the differential diagnosis is shrouded in difficulty, and that the difficulty is rather greater in a case of chronic than of acute obstruction. A well-marked case of invagination, whether acute or chronic, is, however, the easiest of all the forms of occlusion to distinguish, and the diagnosis can generally be made with sufficient approach to certainty to guide the surgeon in the selection of his plan of treatment.

Treatment.—It is evident that the treatment of the conditions we have been describing must differ in every particular from that of those previously described. When the invagination has occurred in the rectum, that is, when the upper part of the rectum has become telescoped into the lower and has appeared as a prolapsed mass outside of the anus, the case may still be relievable by the methods of reduction and taxis. The mass must be replaced by a process exactly the reverse of the one by which it came down, the most dependent portion being first carried into the body and the entanglement unfolded in this way. In a child, with the assistance of anæsthesia, the inverted position, and gentle manipulation with the fingers, or possibly with a soft bougie, this may sometimes be accomplished where the point of constriction is low down near the anus. Prall [1] reports a case where replacement was successfully accomplished by manipula-

[1] Brit. Med. Journ., July 31st, 1880.

tion with the tube of a stomach pump, though the mass could only just be felt in the rectum.

In cases, whether of adults or children, where the constriction is still higher in the intestine, and manipulation with the hand or bougie is out of the question, various other mechanical means may be tried with a prospect of success. These consist in applying indirect pressure to the invaginated portion and to the constricting part by means of copious injections of water or hydrogen gas.

Much has been said against the practice of puncturing a distended coil of intestine with a fine trocar to allow of the escape of gas and thus relieve an obstruction. The operation is not without an element of danger, but in one case of acute obstruction from stricture of the sigmoid flexure I have no doubt that I saved the patient's life by this means combined with the free use of opium. The punctures were made twice daily for some days and gave great relief.

Should attempts at reduction be tried and fail, the surgeon must at once decide between medicinal treatment and laparotomy. The former is included in two words, opium and feeding, and both opium and food are indicated whether an operation is to be done or not. Opium prevents further invagination, and allows of spontaneous reduction provided adhesions have not already formed. The feeding should be by nutritive enemata, if the absence of rectal tenesmus will permit of it. Should this be impossible, the amount of nourishment in fluid form which can be retained by the stomach will probably not be sufficient to support life for any great length of time.

As to the opium, it must be given freely—freely enough to reduce respiration. I have in several cases of acute obstruction secured a natural passage from the bowels by a couple of days' opium narcosis after all other means had failed.

With regard to laparotomy a distinction must again be made between children and adults. In children the disease runs an acute course, often fatal in forty-eight hours, and what is to be done must be done as soon as possible. If, therefore, insufflation or injections fail after a fair trial, nothing remains but to open the abdomen. It is useless to hope for spontaneous reduction or gangrenous separation in a child. Quoting Treves once more, spontaneous elimination occurs in only two per cent of cases during the first year of life, in only six per cent between the ages of two and five, and forty per cent of all cases of spontaneous elimination are subsequently fatal.

Laparotomy in a young child does not hold out much chance of success (eighteen deaths in twenty-two cases under fifteen years of age—Treves), but the earlier it is done the better the prospect.

In adults the operation is not as positively called for as in children, nor need it be done with as great haste, but still it is indicated. The mortality of the disease is seventy per cent, and this will in time be greatly diminished by early operation. The cases which recover are those in which spontaneous reduction occurs, and not those which become chronic or in which gangrenous elimination takes place, for both of these generally end fatally after a time. By laparotomy a reduction may be accomplished, or, failing this, a gangrenous portion of gut may be exsected or an anastomosis established, and a life may be saved in either way. If the case be seen late, it may be better to trust to nature than to inflict the additional shock of this surgical procedure ; but if seen early, and other methods of relief have failed, it should be tried.

It is true that at present the mortality after this operation is very great, but this proves little. The fact is that it need not be great in suitable selected cases properly performed.

The operation of excision with circular enterorrhaphy, though it may be successful in an adult, holds out little hope for a child with acute intussusception. The operation is long and severe, the shock necessarily great, and the patient in no condition to withstand so radical a measure. It is in such cases that Senn's operation of intestinal anastomosis with apposition rings is particularly valuable.

The complications of prolapsus by acute inflammation, strangulation, and sloughing have already been referred to. There remains one other of greater gravity than any of these—the hernia of a part of the pelvic or abdominal contents into the rectum, and generally into an old prolapsus of the second variety. Under its proper title of archocele, or rectal hernia, this affection is seldom found described, and this fact might make it appear to be rarer than it really is. The external variety of it, however, which occurs as a complication of extensive prolapsus, is not particularly uncommon, and will often be found referred to in medical literature under the head of "prolapsus containing loops of small intestine." Such reference is generally limited to a casual mention of the possibility of the condition, and the condition itself has seldom (never in English) been described with any approach to completeness.

Allingham, for instance, says under the head of procidentia recti: "I have had in my own practice many cases of procidentia in which there was a hernial sac in the protrusion, and in all it was situated anteriorly, as, from the anatomy of the part, of course it must be; you could return the intestine out of the sac, and it went back with a gurgling noise. Directly the bowel is protruded you can tell that there is a hernia also present by the opening of the gut being turned toward the sacrum; when the hernia is reduced the orifice is immediately restored to its normal position in the axis of the bowel. I have seen several similar cases in the practice of my colleagues at St. Mark's; the condition is, therefore, not very uncommon, but I have never found it in children."

In the course of the following pages I shall be forced to differ from Allingham in his statement that such a hernia must of course be in the anterior portion of the prolapsus; and, as a matter of fact, quite a large number of all the reported cases have occurred in children, in whom its most frequent exciting cause, prolapsus, is so common.

Van Buren[1] says also under the head of prolapsus: "I am especially anxious to impress you with the fact that there is always more or less of the peritoneal sac carried down with the bowel, and necessarily present in the tumor. I have reliable information of a case in which the removal of a 'complete prolapse' of long standing, in a child, was quite recently undertaken by a hospital surgeon of mature years. The protest of a junior colleague led the operator to pass some deep sutures, in deference to a fear expressed as to the probability of intestinal protrusion, but he was confident that the tumor consisted of mucous membrane alone, and proceeded to remove it. Notwithstanding the deep sutures, protrusion of several coils of small intestine did occur, and the child died, in collapse, within twenty-four hours."

Mollière[2] also refers to the subject under the same head, quoting Cruveilhier, Allingham, and Uhde, and giving the case of Roché in full in a footnote. He merely says: "If the existence of the condition is therefore demonstrated, its history still remains entirely to be written." Esmarch[3] refers to the subject, but adds little to it; and generally, when it is mentioned by the standard writers, it receives but a passing notice.

[1] Edition of 1881, page 60.
[2] Op. cit., page 236.
[3] Pitha u. Billroth, page 154.

Two articles have recently appeared, however, one by Quénu[1] and the other by Englisch,[2] which cover the ground more satisfactorily. These authors have considered the subject from different standpoints, the one writing upon "Spontaneous Rupture of the Rectum" and the other upon "Rectal Hernia," and have made a careful collection of cases coming under each head. Since it is a fact that spontaneous rupture is generally due to a previously existing hernia, Quénu's cases have been included in the following list, the whole having been verified as far as possible, and some others added.

Case.[3]—The patient was a child one year and four weeks old, pale, but well developed, who had frequently suffered from prolapsus. Examination showed a tumor at the anus, 50 cm. long, which plainly contained coils of intestine and reached far out upon the buttock. Four distinct rolls were distinguishable. The outer surface of the prolapsus was reddened, moist, and shiny, and there was no furrow at the anus. There was fever and undoubted collapse, and reposition was impossible, though a large amount of air and serous fluid was evacuated by puncture. The proposed operation—division of the prolapsus longitudinally, reposition of the protruded intestine, cutting off the prolapsus, and closure of the wound with sutures—was therefore abandoned. On the evening of the same day gangrenous spots appeared on the protrusion, and the child died at one o'clock at night.

Autopsy.—Rectum protruding, and the anterior portion of the swelling filled with the ileum, which had also displaced the neighboring small intestine and the transverse and descending colon. The anus was very wide. The contents of the hernia consisted of at least a third portion of the ileum and the sigmoid flexure. The hernial sac and abdominal contents were inflamed.

Case.[4]—The patient was an emaciated female child, twenty weeks old, with severe diarrhœa, and a prolapsus which rapidly increased to the size of a "sausage" and had the appearance of a loop of intestine with the concavity turned downward. Reposition was impossible, and death followed from rapid exhaustion in ten or fifteen hours.

[1] "Des Ruptures spontanées du Rectum," Rev. de Chir., March 10th, 1882.

[2] "Ueber den Mastdarmbruch," Med. Jahr., ii. heft, 1882.

[3] Uhde: Langenbeck's Archiv für klin. Chirurgie, 1867, bd. ix., s. 1.

[4] Brunn: "Beobachtungen und Mittheilungen aus der Praxis 2, Mastdarmbruch," Casper's Wochenschrifte für die gesammte Heilkunde Jahrg., 1833, bd. 2, No. 40, s. 934.

Autopsy.—The prolapse was not reducible, and a longitudinal incision allowed several loops of the ileum, the greater part of which was in the pelvis, to protrude. The uterus was so drawn into the inverted rectum that it could only be pulled out with difficulty. The wall of the rectum was purse-shaped, inverted, and formed the hernial sac. The intestines were empty and inflamed; the other organs normal. Brunn held that the strangulation, though possibly due to the sphincter, was more probably due to the levator ani.

Case.[1]—This patient was a girl seven years old, so thoroughly scrofulous and rachitic as to appear like a child one year of age. On November 12th, 1821, a prolapsus began which in three days increased to the length of the finger, was 8" long, 3" thick, and had a blackish appearance. Simultaneously vomiting began, with fluid and painful passages. Further examination showed widening of the external sphincter, difficulty in replacing the prolapsus, swelling of the protruded rectum, and on that part of the prolapsus which had lain upon the bed, gangrenous spots. After a number of trials, reposition was accomplished, the contraction of the sphincter not being the cause of the difficulty. The reposition was made in this way: The assistant took in his hands, one above the other, the protruded intestine. Pockels introduced his index finger into the intestine, and by means of the thumb pushed it back. During the strong downward pressure of the child the finger was held quietly in the intestine. While the thumb rolled in the edge of the protrusion, the index finger pushed the part up over the sphincter.

During the reposition the examination with the finger showed a very much contracted pelvis. The prolapsus was held up by a T bandage. Afterward when prolapse occurred it was always easily reduced. On December 9th the patient died from exhaustion.

Autopsy.—Intestines in pelvis normal, with no signs of inflammation. The transverse colon was drawn into the inverted rectum and the left ovary was within the grasp of the sphincter. The wall of the rectum was completely perforated at one point, so that a bougie could be introduced through the opening into the abdominal cavity.

Case.[2]—The patient was a woman seventy-two years old, who in the interval between her twenty-third and thirty-fourth

[1] Pockels: "Catalog des Collegium Anat. Chirurg. Braunschweig," 1854; also Uhde, loc cit., s. 13.

[2] Englisch: Med. Jahr., 1882, ii. heft.

years had six confinements without difficulty. The last one caused a rupture of the perineum which completely healed. Shortly after this she began to suffer from prolapsus, which was easily reducible by merely assuming the horizontal position. A slight prolapse occurred after each stool. A few months' stay in hospital, with the use of cold baths and injections, resulted in a decided improvement, and at the time of reporting the case the patient had returned for a second visit. She was poorly nourished, and showed, when standing and after pressure, a prolapsus 9 cm. long, pear-shaped, 27 cm. in circumference, and 30 cm. in the largest part. A groove 1½ cm. deep surrounded the tumor, and there was an opening 2 cm. long at the highest point. The tumor was vaulted on the anterior surface, so that it measured 16 cm. from the edge of the skin, while the measurement on the posterior surface was only 7 cm. The ring surrounding the opening in the tumor exhibited a row of longitudinal folds diverging into a wide tract upon the outer surface. If the finger was pushed through the opening into the rectum, it came in contact posteriorly with the enclosed and enclosing portions of the rectal wall, and, further on, against the point of the coccyx. The further the examination was carried beyond the point of the coccyx the more the layers separated from each other.

The outer surface of the tumor was covered with reddened and sometimes excoriated spots. The wall was about equal in thickness at all points. The outer surface seemed about equally stretched in the middle portion, but somewhat distended at the higher points, and under strong pressure bulgings showed themselves. The consistence was soft, and such as to allow a decrease in size by pressure. The percussion sound was tympanitic in front. A vaginal examination showed the posterior wall to be unevenly stretched backward and downward, forming a shallow depression; but the other parts had suffered no change. If an attempt was made to decrease the size of the tumor by pressure, the twisting and gurgling of the intestine contained in it could be felt both in front and behind, especially in front. If the intestine was completely reduced there remained a slack prolapsed sac 5 cm. long, which could also be reduced. When this was done the sphincter was seen to be dilated so that it admitted three fingers, and the lower part of the rectum was also stretched. When the hernia was not protruded the abdomen was soft and evenly distended; but when the tumor was in the condition first described, the vaulting of the abdomen disap-

peared, especially in its lower part, the umbilicus was depressed about 1 cm., and longitudinal folds appeared in the lower abdominal region, which diverged from the umbilicus toward the symphysis. The curving of the sacrum and coccyx was very slight, and both extended widely backward.

The difficulty of which the patient complained was very trifling, being only that which naturally arose from the presence of the tumor in standing and walking, and the frequent burning sensation which resulted from excoriation of the mucous membrane. There was no pain on defecation except during costiveness, and only occasionally any pain in the abdomen.

Case.[1]—The patient was a middle-aged woman, who was suddenly seized, in the middle of the night, with nausea and pain in the abdomen. After making violent efforts at vomiting she discovered something unusual, which made her think she was about to have a miscarriage, and caused her to send for a midwife. For a time she was attended by a physician, who discovered a large portion of the small intestine outside of the anus, and who finally sent her to Saint George's Hospital. At this time not less than two yards of small intestine, with its mesentery, was protruding from the anus. The whole mass was greatly inflamed, and the loops were distended with gas and fæces. At two inches from the anus a transverse rent on the anterior wall of the rectum could be felt by the finger. Attempts at reduction only succeeded in replacing three-fourths of the hernial mass, and most of this was pressed up into the rectum instead of into the peritoneal cavity, and remained there only as long as the pressure was maintained.

Under these circumstances Brodie made an incision in the linea alba below the umbilicus, and by introducing the finger effected the reduction of the hernia, closing the abdominal wound with sutures. After the operation the pulse was scarcely perceptible, the extremities were cold, and all nourishment was vomited immediately. The patient died in collapse eight hours after the operation.

Autopsy.—The peritoneum was found much inflamed and covered in some places with coagulated lymph ; and there was a transverse wound in the anterior wall of the rectum, with no trace of ulceration in the neighborhood. It was concluded that in this case the hernia was the result of an accidental rupture, and no mention is made whether the patient had or had not previously suffered from prolapsus.

[1] Brodie : London Medical and Physical Journal, 1827, vol. lvii.

Case.[1]—The patient, a male aged forty-five years, entered the Hôtel Dieu October 21st, 1879, in a state of collapse, but with intellect unaffected. On uncovering him an enormous mass of intestinal loops was seen protruding from the anus together with their mesenteric attachment. In spite of his prostration he was able to give the following history: He was well in the morning and went about his usual work. At seven o'clock he had a desire to go to stool, and during the efforts at defecation he experienced pain in the abdomen, became sick, passed a large quantity of blood and finally the intestine. A doctor was called, and after an attempt at reduction the man was sent to the hospital. An attempt was made to discover if he had suffered from any previous rectal disease, and he affirmed that his health had been good, that there had been no emaciation and no previous pain in the abdomen; but during the past two months he had occasionally passed blood at stool, and two years before something came down by the anus which he was able to reduce himself without difficulty. He imagined that a similar accident had happened again. Pains were taken to find out from him whether he had had a fall, or whether he had not introduced something into the rectum, but he always answered in the negative.

The suffering did not appear to be very intense; the abdomen was supple, flat, and only slightly sensitive: at every moment the patient, in spite of advice, made an effort as if in defecation. The intestinal loops which protruded from the anus were piled up one upon the other, and formed a mass the size of a man's head. An approximate measurement gave two metres as the length of protruded small intestine, the serous surface of which forbade any idea of an invagination. The loops were cold and inert, moderately distended with gas, and without any vermicular movement. With regard to color, two different parts of the mass could be distinguished: one violet, ecchymosed, and resting upon the clothes; the other simply congested and appearing to have come out more recently. The mesentery was infiltrated with blood, and there was blood upon the patient's shirt. The anus was large and the sphincter relaxed. There was no trace of rupture within reach of the finger.

The reduction was commenced with those loops which appeared to have escaped last and were the least changed, and after twenty-five minutes it was accomplished. Then the whole hand was passed into the rectum and the rupture was found

[1] Quénu: Revue de Chir., November 3d, 1882.

high up on the anterior wall. A single loop remained in the rectum, and its reduction was not insisted upon, in the hope that the vermicular movement of the bowel might suffice to reduce it. A large tampon of cotton and a T bandage were applied. The patient was relieved by the reduction, but did not rally, and died two hours later without having vomited, and with the abdomen still supple and not distended.

Autopsy.—The loops which had been replaced could easily be distinguished by their color and by the bloody infiltration of their walls. The large intestine was in its place, and the loop which had been left in the rectum had returned to the peritoneal cavity. The abdominal cavity contained one and a half litres of uncoagulated blood. On the anterior surface of the upper portion of the rectum there was a longitudinal wound through which the mucous membrane could be distinguished. The rectum was empty and flat. The bladder was empty, and the lower end of the rupture was eight centimetres from the recto-vesical *cul-de-sac*. The rupture was to the left of the median line, and involved the coats of the rectum to different degrees; the wound in the mucous membrane measuring 4.3 cm., and that in the peritoneum 10 cm. Between these two the layers of the intestine had been dissected up by blood, but the separation had especially affected the mucous membrane, which was separated from the other layers to the extent of 3.4 cm. above, 2.3 cm. below, and from 1 to 2 cm. laterally. The layer of circular fibres had been separated in some places in two planes, one of which remained adherent to the mucous membrane. All the right half of the rectum, corresponding in extent to the rupture, presented a series of soft black protuberances, due to an effusion of blood beneath the peritoneum. The meso-rectum showed no bloody infiltration. The veins of the rectal wall appeared more developed than normal; there were traces of old hæmorrhoids at the anus, and the rectal mucous membrane was absolutely healthy and without a trace of ulceration to the naked eye; but under the microscope it showed marked signs of severe inflammation, similar to those seen in the stomachs of tuberculous persons who have died with symptoms of gastritis.

Case.[1]—The patient, a woman aged seventy-two years, had suffered for several years from an easily reducible prolapse. After a stool without unusual straining, she observed, on returning the prolapse, the sudden appearance of intestine through

[1] Adelmann: Journal für Chirurgie und Augenheilkunde, 1845.

the anus, attended with great pain in the region of the stomach. As a result of straining the hernia rapidly increased, and Adelmann found five ells of small intestine prolapsed, the mass reaching the ground and soiled with dirt and urine. The protrusion was dark-colored, and the mesentery was marked with dark spots. It lay in six loops, the lowest being longest, and the shortest uppermost. The sphincter was relaxed. The rupture was on the right side of the rectal wall, $2\frac{1}{2}''$ from the anus, running from behind forward, and allowing only the front part of the sharp edge to be plainly seen. Its length was $2\frac{1}{2}''$.

Reposition was undertaken in the knee-elbow position and proceeded with comparative ease till the pelvis was full, after which no more could be replaced, the abdominal cavity not having been accustomed for a long time to the presence of the intestine. A laparotomy was therefore necessary. An incision was made at the level of the umbilicus, 3″ from the median line to the right, at the outer edge of the rectum, 4″ long, extending downward to within three fingers' breadth of the pubes, permitting the entrance of the hand into the abdomen. By passing the hand along the mesentery to the rent the intestine could be drawn back with the help of an assistant. In this way one and a half ells were returned, and the rest was punctured with a broad needle to allow the escape of gas and contents. The discharge through the prolapsed mucous membrane was not at all free, and it was assisted by introducing a sound through the punctures. After removing the hand from the abdomen the reposition could be carried no further, and a loop of intestine also appeared in the abdominal wound. After placing the patient on the left side the rectum was exposed, and the rent, which had sharp edges through its whole extent, was united with seven sutures. The sutures in the middle of the wound were placed at some distance from each other, to allow of discharge from the pelvic cavity. Toward the end of the suturing the contractions of the levator ani could be distinctly appreciated. After replacing the intestinal loop the abdominal incision was also closed. Three fluid passages occurred immediately after the operation was completed, and the patient died ten hours later, and seventeen hours after the accident.

Autopsy.—Six or eight ounces of sero-sanguinolent fluid in the peritoneal cavity, without trace of coagulation. No peritonitis in the neighborhood of the rupture. The mucous membrane was inflamed and congested, and in some places eroded, and there were red spots on the visceral layer of peritoneum,

formed by an effusion of blood between the layers of intestine. Especial attention is called to the fact that the nail of the index finger on the patient's right hand was sharp, and it was thought that in the efforts at replacement this might have lacerated the bowel and thus caused the rupture of the hernial sac.

CASE.[1]—The patient, a woman fifty years of age, had suffered for many years from severe prolapsus. Being engaged in a fight with another woman, she was thrown upon her back, and the prolapsus was injured by the feet in the struggle. Immediately after she wished to go to stool, and after some straining she passed a considerable quantity of blood and some loops of small intestine. The hernia, which was at first the size of the fist, constantly increased by the straining of the patient, and she died in collapse twelve hours after the accident.

Autopsy.—The intestine was found inflamed; all of the larger bowel was contained in the pelvis, and the stomach was forced downward into a vertical position. The prolapsed bowel was 12′ 10″ long, and included the whole ileum beginning 2″ from the ileo-cæcal valve, and also a part of the jejunum. The rupture was on the posterior wall 1″ from the anus, and four fingers' breadth long. The abdomen also contained extravasated fæces.

CASE.[2]—The case was that of a woman, aged forty-six years, who about twelve years before, a short time after a difficult labor, had begun to suffer from prolapse which came down daily at the time of defecation and was easily reducible. She was seen by the doctor at a time when the tumor had been down nearly twenty-four hours, and had resisted all the efforts of herself and female friends at replacement. She had passed a restless night and was much fatigued by her journey in an old cart, but had experienced no bad symptoms referable to the stomach or bowels. The doctor found at the anus a tumor larger than the fist, round, red, and covered with bloody mucus.

The prolapse was directly continuous with the margin of the anus, in such a manner as to render the introduction of a sound between them impossible. At the extremity of the tumor there was a rounded aperture which admitted the finger without obstacle. To accomplish the reduction the woman was placed on the bed with the thighs separated: the tumor was seized in the palms of the two hands and the ends of the fingers, and a gen-

[1] Pyl: "Pyl's Aufsatze und Beobachtungen," zweite abtheilung, p. 133; or Adelmann, loc. cit.

[2] Roché: Revue Méd. Chirurg., 1853.

tle circular compression was exercised in order to diminish its volume and cause it to go up by an operation similar to the taxis. The resistance being great, a few moments were allowed for rest, and after a quarter of an hour the same manœuvre was repeated, after having enveloped the tumor in a cold cloth. "After a few moments I felt," says the narrator, "during a violent effort of the patient, the tumor distend under my fingers, and at the same time I heard a noise similar to that made by tearing parchment. At the same time the tumor suddenly disappeared of itself, and syncope, nausea, and a marked change in the expression of the face supervened.

"When the patient came to herself she complained of severe colic. I then found outside of the anus a loop of intestine, which I easily replaced, and on introducing the finger into the rectum I recognized at a considerable height an irregular, longitudinal rent, the extent of which I was unable to determine. I placed a tampon of lint over the anus and kept it in place with a T bandage and compress. I sent the patient to her home, ordering that nothing be disarranged. As the case was very serious, I requested a neighboring *confrère* to come and aid me with his advice. At our arrival, six hours after the accident, I found the patient sitting by the corner of the fire, without the dressings. Between the separated thighs were exposed, in the midst of the ashes, the large and a considerable part of the small intestines, distended with gas, cold, and in several spots livid. The face was Hippocratic, the pulse thready and much accelerated, the voice feeble; and to this were joined colic and continual vomiting. After having placed the woman in bed and raised the intestines, the mass was replaced within the body, the former dressing was applied, and the woman died in a few hours."

CASE.[1]—A woman, thirty years of age, wishing to lift a heavy vase, and stooping over to accomplish it, suddenly caused a very considerable intestinal hernia to appear through the anus, which could not be reduced even by the introduction of the whole hand within the rectum. Stein thought he might be able to effect the reduction by raising the pelvis, but, this manœuvre failing, he cut the intestine to empty it of its contents, hoping at the same time to establish an artificial anus. Death followed on the sixth day from general peritonitis.

Autopsy.—Rupture 10″ long in the anterior wall of the rec-

[1] Stein: Pitha und Billroth, "Chirurgie."

tum, through which several feet of the small intestine and two inches of the cæcum had protruded.

Case.[1]—In this case, which is reported by Fiedler from the practice of Ohle, and copied by Ashhurst, the patient, a man, gave a past history of hæmorrhoids, obstinate constipation, bloody stools, difficulty in micturition, and finally the development of a tumor filling the anus. Without known cause he was attacked with fever, vomiting, and great pain in the abdomen. An examination revealed the presence of a swelling at the anus, 3″ in diameter, and this was incised on the diagnosis of an attending physician. It contained one of the appendices epiploicæ and a piece of small intestine. To replace this Ohle made an incision on the left side from the tip of the tenth and eleventh costal cartilages to the anterior superior spine, $5\frac{1}{2}$″ long, parallel to the linea alba and $3\frac{1}{2}$″ from it. Through this the transverse colon was drawn outward, the intussusception reached, and the small intestine drawn out of the wound in the rectum, while an assistant made pressure from without. The patient died of peritonitis.

Case.[2]—The patient was an old woman who had borne three children without difficulty. Following the second birth there was a prolapse of the vagina, and after the third a prolapse of the rectum accompanied by alternate diarrhœa and constipation. For the last ten years the prolapse had been increasing in size and had remained out of the body when the patient was in the horizontal position. At the same time inflammation had occurred, so that she was obliged to take to her bed. This inflammation suddenly became increased, the patient had a chill with severe colicky pain in the lower pelvis radiating from the rectum and the genitals, and high fever. Later there was vomiting, and after eight days a rupture of the weakened hernial sac and death from peritonitis.

Autopsy confirmed the diagnosis of rectal hernia.

Case.—The same author reports another case, in a woman forty years of age, who had never borne children. In her childhood she had suffered from a prolapsus, which, however, had always been reducible. This again developed later, and was only reducible with difficulty and undoubtedly contained intestine.

[1] Ohle. Fiedler: Magazin der gesammten Heilkunde von Rust, bd. 2, s. 253, 1817. Ashhurst: Amer. Jour. Med. Sciences, 1874, vol. ii., p. 48.

[2] Chirurgische Versuche, Nurnberg, 1818, bd. 2, p. 186.

Case.[1]—In 1835 a feeble child, one year old, was brought for treatment who had a prolapse 3″ long and of unusual thickness. The examination showed an undoubted interval between the two layers of the inverted rectum in front, and intestine between them. Reposition was impossible, and the weakness of the patient rendered operation out of the question. The child died on the same day. No autopsy.

Case.[2]—This surgeon observed in 1844, in a child two years of age who suffered with the symptoms of volvulus, a swelling in the rectum which occluded it so completely that the finger could not be made to pass. After death, which soon followed, a large coil of intestine was found in the swelling. No more accurate description of the case is given, but from the author's few words it would seem to have been one of the class of internal rectal herniæ shown in Fig. 103.

Case.[3]—This was a case of prolapsus the size of the fist, in a woman, which evidently contained intestine. After replacing the hernial protrusion, the prolapsus was cut off with an *écraseur*, and with it the hernial sac lying in the anterior part. On the day after the operation both the folds of peritoneum became loosened and a large mass of small intestine appeared. The patient died of peritonitis.

Case.[4]—The patient, a woman aged forty-five years, had had several children, the last confinement being twenty-two years before, and all having been without difficulty. Eleven years before she felt a good deal of uneasiness about the anus, with difficulty in defecation. One morning, when getting out of bed, she felt a tumor projecting from the anus. It was ab out the size of a walnut and became larger on exertion. After a while it always came down when she went to stool, and she could not defecate without passing the hand into the rectum and pushing the substance aside. She had a good deal of pain about the umbilicus and was always constipated. During the last ten months the prolapse had increased till it had reached the size of a cocoanut, and was always down when she was at work, though she was comparatively comfortable when in the horizontal position.

Operation.—It was discovered that the anterior fold of the

[1] Baum: See case of Uhde, loc. cit.

[2] Dieffenbach: "Operative Chirurgie," bd. 2, s. 631, Leipzig, 1848.

[3] Streubel: "Handbuch der Chirurgie" von Pitha und Billroth, bd. 3, abth. 2, s. 336, Schmidt, Hernien

[4] Stocks: Brit. Med. Journ., June 1st, 1872, p. 584.

protruding bowel contained a large, globular body which could easily be encircled at the base by the finger and thumb. On passing the forefinger of one hand into the vagina and that of the other hand into the rectum, their points could easily be approximated above the tumor. On rubbing the ends of the fingers together in this position, a cord, feeling precisely like the spermatic cord in the male, with its vas deferens, could be felt rolling between them. It was concluded that this cord was the Fallopian tube and that in all probability the tumor was an ovarian cyst.

An incision was made on the anterior aspect, a small ovarian tumor was turned out, the pedicle was tied with a strong hempen ligature, the tumor removed, and the wound closed with the uninterrupted suture. There was considerable bleeding from the wall of the rectum, requiring one or two ligatures, and the prolapsus was left outside of the sphincter. After healing of the incision this could be returned without pain, and the patient made a good recovery.

CASE.[1]—As this case seems to have been beyond the reach of both Quénu and Englisch, both of whom refer to it without having been able to obtain it; and as it is short and very important, we transcribe it in full:

"*An Account of a very Remarkable Case of a Boy who, notwithstanding that a Considerable Part of his Intestines were forced out by the Fall of a Cart upon him, and afterward cut off, recovered and continued well.* Read June 12th, 1755.

"On January 3d, 1755, I was called to John, the son of Lancelot Watts (a day laborer living in Brunsted), a servant-boy to Mr. Pile, a farmer in Westwick, near North Walsham, Norfolk, aged thirteen years. He was overturned in a cart and thrown flat on his face, with the round or edge of one side of the cart (bottom upward) whilmed (*sic*) across his loins, the upper part of the body lying beyond the wheel at right angles. In this helpless condition he continued some time, and was found with a very large portion of the intestines forced out at the anus, with part of the mesentery (and some loose pieces of fat which I took to be part of the omentum) hanging down below the hams double, like the reins of a bridle, very much distended and inflamed. He had a continual nausea, and violent reachings to vomit, and threw up everything he took. The pain

[1] Nedham, "Philosoph. Trans.," vol. xlix., 1755, p. 238.

of the stomach and bowels was exquisite, attended with convulsions; his pulse low and quick; and frequently he fell into cold sweats. After using an emollient and spirituous fomentation I reduced the parts, though to no purpose; the vomiting immediately returned and forced them out again. Next day the fever increased, the nausea and reachings to vomit continued, the parts appeared livid and black, with all signs of a mortification. On the third day, the mortification increasing, I cut off the intestine with the mesentery close to the anus. He had had no food from the time of the accident, but soon after the operation there was a very large discharge of blackish and extremely offensive fæces, which continued several days, lessening by degrees. He soon grew easy and the nausea and vomiting abated. I gave him *Tinct. Cort. Peruv., simpl.*, twice a day; and, as he complained at times of griping pains, he took now and then *Tinct. Rhubarb vinos.*, and had recovered a good state of health. For some time he had six or seven or more stools a day; at present commonly three or four, all loose, which come soon after eating; and frequently he is obliged to hurry out to ease himself during his meals.

"I have three times lately tried if I could discover a passage through the coats of the rectum with my finger, and I think I have always felt an opening, just above the sphincter, toward the spine, the circumference of which was full and protuberated, seemingly as large as my finger, the lower edge of which was harder than the rest; he complained of pain when I pressed the upper part.

"The intestine cut off measured fifty-seven inches, by a string applied to the outer surface.

"On May 7th the boy came walking from Brunsted to North Walsham (seven miles), and dined with me, was perfectly well, and walked back again that afternoon. JOHN NEDHAM.

"Witness, E. BROOKE, *Surgeon.*

"NORTH WALSHAM, NORFOLK,
"May 28th, 1755."

CASE.[1]—"The patient was an elderly man who had a prolapsus as big as a cocoanut always coming down and rendering his life a burden. He had already been operated upon twice by a hospital surgeon, but in vain. The patient was then sent to me, and, formidable as the case looked, I determined to undertake it. I applied the clamp deeply in three different directions.

[1] Henry Smith: Lancet, March 15th, 1880.

There was a great deal of bleeding, and I had to apply the cautery over and over again before I could stop it; and then, just as I was finishing the operation, a most untoward event occurred—severe vomiting, as the result of the anæsthetic, took place. The prolapsus was forced still further down, and before I and my assistants could return the parts the violent action of the abdominal muscles was such that the weakened coat of the bowel gave way, and a knuckle of small intestine actually protruded through the rent thus made. I carefully returned this as soon as the vomiting ceased, and anxiously awaited the result. Our house surgeon, Mr. Newmarch, watched the patient with great care and treated him with great skill, keeping him constantly under the influence of opium, and locking up his bowels for several days. The result was not a single bad symptom of any kind. On the first action of the bowels there was no protrusion, nor afterward, and as soon as the man was fairly recovered I removed three longitudinal folds of skin from the anus so as further to tighten the parts. The man was completely cured. Now, the lesson this case teaches is this—not to employ an agent which could cause vomiting; because, of course, in such a terribly severe case as this it is absolutely necessary to clamp deeply and thus weaken the bowel. It was a most unlooked-for accident, not likely to occur again; in fact, it is hardly reasonable to expect to meet with another such a case for operation. I have, however, been called to cases as bad or worse, but where no operation could be recommended."

Quénu has more recently reported another case.[1] The woman, aged sixty, of very weak constitution, had suffered for six years from prolapse of the rectum, which, however, was easily reducible. Being habitually constipated, she made free use of purgatives and frequently passed blood. For the last six weeks she had suffered more than usual and had kept her bed. The day of the accident she made great efforts at defecation, and suddenly felt something come down followed by great pain and loss of blood. A doctor who was called ordered her sent to the hospital, and when Quénu arrived he found the woman pale and cold, with a yard of intestine, black and shrivelled, protruding from the anus. With a finger in the rectum a large rent by which the intestine escaped was felt in the anterior wall. Under chloroform, the abdomen was incised in the median line and nothing but blood was discovered. The prolapsed intestine was removed close to the anus, but all attempts to suture the rent

[1] Med. Press and Circular, February 8th, 1889.

were useless. Iodoform dressings completed the operation, and the patient died on the next day. The autopsy revealed a rent an inch and a half long, together with a considerable number of varicose veins in the rectal wall.

There are several varieties of this affection, that in which the sac is composed of an old prolapsus being the most common. This may be characterized as the external form. In it the sac and contents will generally be found at the front of the prolapse, for the reason that there is more room for the escape of the hernial contents from the pelvis here than behind. By glancing at the cut (Fig. 96), however, it will be seen that the peritoneal fold has been drawn both in front and behind, and the hernia may be in either place. This is in opposition to Allingham's statement, but is supported by clinical evidence. In the case of Englisch particular attention is called to the coils of intestine in the posterior part of the prolapse, though they were more marked in front.

In the external form the sac is first formed, and remains ready at any time for the reception of its contents. It may never be occupied, or it may suddenly be filled by a loop of intestine as a result of a sudden strain or violent action of the abdominal muscles. There is another variety, which may be known as the internal, in which the relation is somewhat different. In it the rectal wall at some especially weak point yields to the pressure of the pelvic contents, bulges in on one side in the form of a sac, and finally forms a considerable tumor occupying the rectal pouch. (Fig. 103.) The favorite site for such a sacculation to commence is at the recto-vesical *cul-de-sac*, and such a tumor may never come below the sphincter.

The sac of an internal hernia is not always composed of all the layers of the gut, for the reason that the muscularis is apt to be weakened before such a condition can arise, and in the subsequent increase in growth it may rupture and leave only peritoneum, cellular tissue, and mucous membrane.

Another variety is that in which no proper hernial sac can be found, the coils of intestine lying loose in the rectal pouch or projecting beyond the sphincter. These are the cases described by Quénu as spontaneous rupture of the rectum, to distinguish them from the results of direct traumatism, such as might be caused by a foreign body puncturing the rectal wall or the pelvic diaphragm. Many of these cases are undoubtedly the result of the rupture of a previously existing hernial sac, and are therefore merely complications of the varieties already

described. In the case of Brodie no previous prolapsus is mentioned, and the rupture is believed to have been the result of an accidental tearing of the rectal wall. In the case of Quénu the history of previous prolapse was carefully sought for and not obtained ; still, there is no proof that both of these cases might not have been complications of previously existing internal herniæ. Quénu's patient gave a distinct history of former rectal trouble and bloody passages, and had once, two years before the rupture, suffered from some kind of a protrusion from the anus, which he had reduced himself.

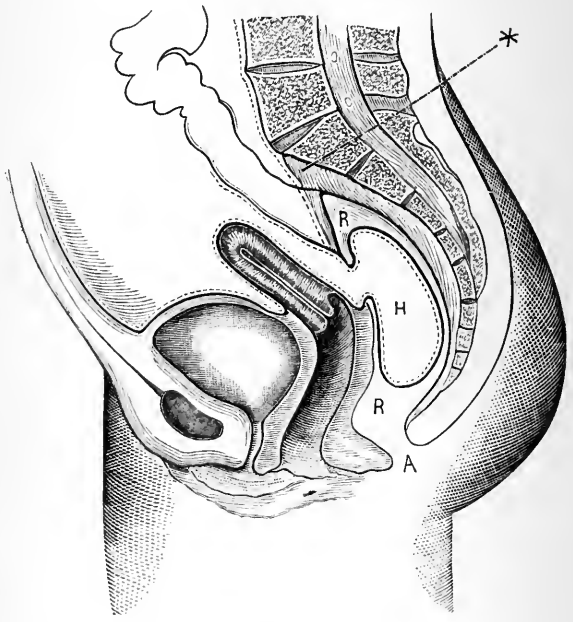

FIG. 103.—Internal Rectal Hernia. R R. rectum laid open laterally; H, empty hernial sac with its neck at Douglas's pouch, protruding into and filling the rectum; - - - - Peritoneum.

In the cases of rupture reported by Adelmann, Pyl, Roché, and Schrager, the previous existence of prolapsus is distinctly stated. In the case of Stein no data are given upon which to base an opinion. It is possible, however, that rupture of the rectum may occur as a result of severe straining where there has been no previous hernia. but it does not seem probable that such rupture ever occurs without the existence of previous disease which has weakened the wall of the rectum at the point where the rupture takes place, except in cases of direct trauma-

tism, as in childbirth or the introduction of foreign bodies, or in the case of an accident such as is reported by Nedham.

In the cases of Quénu the rectal wall seemed to the naked eye to be perfectly healthy, and yet an examination with the microscope showed the signs of inflammation and infiltration of the wall with white globules. In Brodie's case the mucous membrane is said also to have been healthy, but no microscopic examination is reported, and the statement cannot, therefore, be allowed much weight. In all the cases of rupture complicating previously existing herniæ, a change in the hernial sac of a character to render rupture easy may be taken for granted, if not distinctly stated to have been present. In Adelmann's case the mucous membrane is said to have been congested, inflamed, and eroded in spots. In Roché's case the prolapsus had been down twenty-four hours and "*had resisted all the attempts of the patient and her female friends at replacement.*" Besides these direct statements we know the changes which occur in an old prolapsus, and especially in an irreducible one. These are a thickened, eroded, granular, and œdematous condition of the mucous membrane; a deposit of albuminous material in the submucous connective tissue; and the final production of a foul, hypertrophied, eroded, and bleeding mass. Quénu has studied this point very thoroughly, and lays great stress upon the dilatation and alteration of the veins. The straining causes the rupture of a vein, and the infiltration of blood among the diseased tunics of the prolapsed rectum causes their rupture. There is an œdema of the hernial sac, a catarrh of the mucous membrane, a dilatation of the veins of the mucous and submucous tissue the wall of the vein becomes infiltrated with leucocytes, and the predisposition to rupture is established. An effort at abdominal expulsion increases the tension of the blood in the dilated vessels rendered feeble by inflammation; a vein ruptures as in a varix of the extremities; the blood percolates the layers of the sac all the more readily as the infiltration of white corpuscles has prepared the way; and the walls of the bowels, dissected up by the blood and already altered, finally give way.

The rupture may occur at any point in the hernial sac, or in the rectal wall when no hernial sac is discoverable. Thus in Quénu's personal case it was in the anterior wall of the upper part of the rectum a little to the left of the median line, its lower end reaching to within 8 cm. of the recto-vesical *cul-de-sac*. In Adelmann's case the rent was longitudinal, $2\frac{1}{2}''$ above

the anus. In Pyl's case it was on the posterior wall an inch from the anus; in Stein's case on the anterior wall; in Roché's case it was longitudinal at a "considerable distance from the anus"; in Brodie's case it was anterior, 2″ from the anus.

The length of the rupture may also vary greatly. In Adelmann's case it was 2½″ long; in Stein's 10″; in Roché's its extent could not be determined without an autopsy; in Pyl's, four fingers' breadth; in Quénu's it was 4.3 cm. in the mucous membrane, and 10 cm. in the peritoneum.

The rupture is probably always due to force applied from within the hernial sac or from the direction of the abdominal toward the rectal cavity, and not *vice versa;* and the peritoneal coat, on account of its greater tenuity and slight elasticity, is probably the first to give way. The immediate cause of the rupture is probably an over-distention of the sac with loops of intestine filled with gas and fæces, and then a straining on the part of the patient by which fresh coils of intestine or more air and fæces are forced into the sac. Brodie's occurred during an effort at vomiting; Stein's while lifting a heavy weight; and those of Quénu and Adelmann during the act of defecation. Pyl's case occurred also during defecation, but the patient had just previously been thrown upon the floor and the hernia was probably injured in the fight. In the cases of Streubel and Ohle the opening in the hernial sac was due to surgical interference; and in Roché's case the rupture occurred during the surgeon's forcible attempts at reduction.

The contents of the hernial sac are generally loops of small intestine; quite frequently, however, portions of the colon and sigmoid flexure have been found; in Stocks's and Pockel's cases an ovary; and in Brunn's and Englisch's cases the uterus. The size of the hernia may be so small as to lead the unwary into the belief that it is a simple prolapse composed entirely of mucous membrane, or it may reach the dimensions of an adult head. After the rupture of the sac the intestine may escape to the length of several yards.

Diagnosis.—Nothing need be said upon the diagnosis of a rectal hernia in which the coils of intestine protrude from the anus uncovered by any hernial sac. In such a case a mistake would seem to be well-nigh impossible. In an internal rectal hernia (one which has not passed the anus) the diagnosis will lie between it and an intussusception; but a careful examination with the finger, or the whole hand if necessary, should reveal the presence of a sac containing loops of intestine which

can be pressed out of it into the general peritoneal cavity ; of a pedicle to the tumor thus formed ; and of an opening in the wall of the bowel which constitutes the mouth of the sac.

In ordinary cases of hernia which have become external, the diagnosis will lie between hernia and prolapsus without hernia. Often the different coils of intestine within the prolapsus can be felt between the fingers, the index finger being passed up into the rectum and the thumb remaining outside. The coils may also be reduced from the sac with a gurgling noise, and the sac may be tympanitic on percussion, especially in front. The thickness of the mass and its pear shape are also points of importance, and the peculiar enlargement in circumference which it undergoes when the patient strains, instead of the mere lengthening which occurs under similar circumstances in a simple prolapsus. A careful examination here also may enable the surgeon to trace the pedicle up into the pelvis, and the position of the opening into the rectum, as it is turned back toward the coccyx by the bulging of the anterior portion of the tumor, is worthy of notice. The diagnosis is always complicated by the condition of irreducibility, but even here tympanitic resonance on percussion, and gurgling of air on palpation, remain to assist the examiner. The flattened appearance of the lower abdomen, the sinking-in of the umbilicus, and the folds of the abdominal wall radiating from it, may also indicate that the abdomen has lost a part of its natural contents.

A rectal hernia, like one into the scrotum, may be reducible, irreducible, inflamed, or strangulated.

A rectal hernia which has previously been reducible with proper manipulation, may become irreducible from a variety of circumstances. The obstacle to reduction may be at the neck of the hernia outside of the sac, or within the hernial sac. As is the case in any hernia of the intestine, it may be reducible when the coils of intestine filling the sac are empty, and irreducible when they by chance become distended with gas or fæces. Or the neck of a hernial sac which will allow the passage back and forth of a certain amount of intestine, may not allow of the return of an unusual quantity which has been forced through it by some unusual pressure. But probably a more common reason for the irreducibility of a rectal hernia which is not strangulated will be found in an inflammation of the sac which has united the peritoneal lining with the peritoneal covering of the contained intestine. A chronic inflammation of a rectal hernia is by no means uncommon. This is generally the con-

dition of the mucous membrane covering the sac, and it is due to its exposed position and the frequent slight injuries it receives.

If the injury be more severe, as a kick or a blow, or if the sac be exposed to cold or wet, there may supervene an acute peritonitis starting in the sac and possibly extending to the general cavity of the abdomen. Such an inflammation will generally be ushered in by a chill and more or less pain in the hernia and abdomen. The inflammation is shown by the dark-brownish, ecchymosed appearance of the mucous membrane; by its dryness or the presence of a muco-purulent or bloody discharge; by the loss of elasticity in the sac which results from the infiltration of its different layers; and by its increased friability, and the constant spasm of the sphincter. There may be an increase in the size of the hernia from distention of its contents with gas as the peristaltic action ceases under the inflammation; and, finally, the signs of intestinal obstruction with general peritonitis. Such a condition may result in gangrene and in perforation. Brunn's case was one in which inflammation of an irreducible hernia ended fatally, and in Uhde's case gangrene and death were the result.

When perforation results an artificial anus is formed. If the perforation happen to be outside of the sphincter, the condition is easily diagnosticated by simple inspection. If the hernia be an internal one, or if a fistulous communication be established between the small intestine contained in the hernial sac and the cavity of the rectum above the point which can be reached by a digital examination, it may entirely escape diagnosis.

Another condition which may render a hernia irreducible is strangulation, and in this, as in abdominal herniæ, the constriction will be found at the neck of the sac—in other words, at the level of the pelvic diaphragm. It is possible that if a mass of intestine, with or without a hernial sac, has been forced out of the anus, where there has been no pre-existing prolapsus, strangulation may be caused by a contraction of the sphincter muscle; but in general the power of this muscle has been so weakened by previous stretching that it is incapable of causing strangulation, and the constriction will be found at the level of the levator ani, and on the front, back, or side of the rectum, wherever the neck of the hernia may chance to be.

Treatment.—The treatment of rectal hernia at once divides itself into curative measures for the uncomplicated condition,

and the treatment of the complications—inflammation, strangulation, and rupture.

In reducing a rectal hernia the same accident may happen as in other herniæ, and the sac and its contents may be pushed above the sphincter *en masse*. This is best avoided by keeping a firm hold upon the sac while the intestinal loops are expressed from it.

A reducible rectal hernia may, after reduction has been accomplished, be treated as would an old and extensive prolapsus without hernial contents, and it is unnecessary to recall the various measures in the hands of the surgeon for dealing with this condition. But rectal hernia is a more serious condition than prolapsus, and certain more radical measures may be justifiable in the treatment of it than would be in dealing with an affection which, however disagreeable, does not generally endanger life. In cases where free and extensive cauterization has failed to keep the hernia within the anus, nothing remains but the ablation of the sac. A glance at the table of cases will show that Uhde abandoned the idea on account of the strangulation of the hernia and the collapse of the patient; and that Streubel cut off the sac with the *écraseur*, and the hernial contents protruded through the wound on the following day with fatal result. The cases mentioned by Van Buren ended in much the same way in spite of the sutures which were introduced to prevent the escape of the hernial contents. Smith operated in a similar case with his clamp and cautery, and had the same accident, though the case terminated favorably. These results seem to point to the advantages of any method which will more certainly insure the avoidance of an appearance of coils of intestine through the wound.

If the clamp is used, the hernial contents must first be reduced and held up by an assistant, who grasps the prolapse firmly in his fingers and thus prevents their re-descent. The clamp and cautery are then applied as deeply as may be necessary. After all hæmorrhage has ceased, and before the clamp is removed, the opening in the sac should be stitched up with a catgut ligature applied immediately beyond the clamp. The ligature should be armed with a needle at both ends, and the stitch is the same that a shoemaker uses in sewing a shoe. After the wound made by the clamp has been closed in this way, it may be removed. As the hernial sac is generally confined to a portion of the prolapse in front, and does not fill it all around, one or two such ligatures will be sufficient to prevent

any escape of small intestine. Other parts of the prolapse may be clamped off without the precaution of the ligature, and the customary treatment followed with the addition of sufficient opium to secure absolute rest.

The operation with the elastic ligature is one invented and successfully practised by Kleberg.

In this case the prolapse was about a foot in length and six inches in diameter. The mucous membrane was spongy, bleeding, excoriated, and ulcerated. The patient had been sick for two years, had been bed-ridden for two months, and was waxy pale.

On the previous day a dose of castor oil was given, and on the morning before the operation an enema of lukewarm water was administered high up the bowel. Immediately before, a glass of wine and one grain of opium were given. After the patient had pressed down the gut as far as he could, he was placed on the operating table in the lateral position, with the pelvis raised and shoulders turned downward. Chloroform was then administered. In two cases Kleberg has operated without chloroform because the patients were in such a miserable condition that he was afraid to narcotize them thoroughly, and an incomplete narcosis has all the dangers of profound anæsthesia and none of its advantages. After the chloroform, he says, "I carefully examined about the rectum, at the junction of the skin and mucous membrane, in order to discover the sphincter ani—a procedure that was more difficult than one would think, because it had become so stretched and atrophied that I could only make it out by feeling under the fingers the coarser fibres running across the longitudinal axis of the bowel. Of anything like the normal muscle there was nothing to be discovered.

"An assistant, at this point, surrounded with all the fingers the prolapsus from above, the points of the fingers being directed toward the free end of the prolapsus, and pressed as hard as possible into the gut at a point perhaps half an inch below the supposed sphincter. Immediately in front of the ends of the assistant's fingers I then placed a good, fresh, unfenestrated drainage tube of rubber, one and one-half lines in diameter, around the prolapsus, and drew it only as tight as seemed necessary to stop the circulation. The elastic ligature was brought to the necessary tension by means of an easily untied slip-knot of silk thrown under it.

"The assistant now had both hands free; and from this time on the operation was performed under the carbolic spray. A

few lines beneath the ligature I now made a longitudinal incision two inches long through the prolapsed gut, and in this way opened the sac formed by the drawing down of the peritoneum. Then I seized the elastic ligature with the forceps and fixed it firmly. It was thus an easy matter to push back into the peritoneal cavity a protruding loop of intestine without the slightest bleeding taking place into the wound or any air entering the peritoneal cavity, because the elastic pressure follows so rapidly all the movements that no opening can exist anywhere.

"After I had convinced myself that the peritoneal sac was empty, and that no invagination of the intestine was present, but, on the other hand, only that part of the gut which was to be removed lay in front of the ligature, I thrust the largest size Luer's pocket trocar through the prolapsus, immediately below the elastic ligature, from before backward, and passed through the canula two elastic drainage tubes of one and one-half lines in diameter, and, after removing the canula, tied them as tightly as possible, one on the right side, the other on the left. These knots were secured against slipping by means of the knot of silk. The first provision against hæmorrhage—the elastic ligature applied after Esmarch's plan—was then removed and the prolapsus cut off with the scissors one inch in front of the permanent ligatures. After a few minutes' time, during which I kneaded the parts which still remained and lay above the ligatures thoroughly, and as far as possible removed the fluids from them, I covered the parts around the stump with cotton, and soaked the part of the prolapse which still remained above the ligature with a solution of chloride of zinc, dried it, squeezed the soft parts once more, thoroughly applied the chloride of zinc again, and then covered the whole with dry cotton batting, giving the patient instructions to remove this as soon as it became moist and to replace it with dry, and to give the air all possible access to the parts."

No fever followed the operation, and the pain was bearable with the aid of an occasional opiate. On the next day the parts had so far shrunk as to leave a concavity at the anus where before there had been a bulging. There was no bleeding, no peritoneal irritation, and only slight tenesmus. On the fourth day the first ligature was cut out, and the second on the fifth. The rectum was irrigated twice a day with water and permanganate of potash, and on the seventh day a dose of castor oil was followed by a large evacuation while the patient was on his back, without pain or hæmorrhage. The passage, however, was in-

voluntary. On the fourteenth day the wound was healed, the general condition of the patient excellent, and the evacuations regular but still involuntary. The sphincter at this time began to be appreciable, and there was no protrusion of the bowel, the patient going about and wearing a bandage. One month later he had control of solid fæces, but there was still a slight discharge of mucus ; and after another month he was entirely well.

Another case by the same surgeon and the same method ended fatally, but can hardly be considered a fair test of the dangers of the operation, on account of the exceedingly bad condition of the patient ; still the operation is one of extreme gravity, and its results so far have not been encouraging.

The existence of an irreducible rectal hernia, even without any signs of acute inflammation, justifies the division of the constriction and its reduction ; for such a hernia, unlike one in the scrotum, is constantly subject to influences which may at any moment excite a fatal peritonitis.

In cases of inflamed rectal hernia, the treatment should be directed toward reducing the inflammation by rest, local antiphlogistic measures, and opium. If reduction be possible it may be performed. If reduction be impossible and the hernia acutely inflamed, it must be treated, as a strangulated hernia elsewhere would be, by operation tending to divide the constriction causing the strangulation. If the constriction seems to be at the sphincter ani, it can easily be overcome by stretching without a cutting operation and without opening the peritoneum. If it be at the neck of the sac the same manœuvre may be possible. Various methods of subcutaneous section of the constriction have been recommended, but none of them rest upon any clinical experience.

If the constriction cannot be overcome by stretching with the fingers, and if reduction cannot be accomplished by this means joined with anæsthesia, nothing remains but a longitudinal incision into the hernial sac as near the neck as possible, and the division of the neck with the hernia knife as in an ordinary case of strangulated hernia.

In case a rupture of the sac or of the rectum has already occurred and the intestines have escaped through the rent, there is still much for the surgeon to do, although the prognosis is almost hopeless. Smith's case recovered, but here the accident occurred directly under the eye of the operator, and the bowel was immediately replaced before it had been long exposed to the air or had become inflamed.

It will be noticed that in every case but one where the rupture has been due to violence, death has been the consequence; and also that in every case but that one (Nedham's) an effort has been made at reduction, even though laparotomy were necessary for its accomplishment.

There is no doubt that the first duty of the surgeon is to replace the mass within the abdomen after cleansing it, and this is seldom an easy matter. The amount protruded is often enormous; it is also generally distended with gas and fæces; the rent through which it must be returned is more or less concealed from vision and touch; and the intestines constantly tend to pass upward into the rectum above the rent rather than into the peritoneal cavity. As Quénu, who has thoroughly handled this branch of the subject, suggests, those loops which have descended last, and are therefore the least changed in appearance, should first be returned. A part of the contents of the bowel may be pressed back into the abdomen by gentle manipulation, and punctures may be made to evacuate the remainder. The reduction, however, has seldom been completely accomplished without recourse to laparotomy.

After the reduction has been accomplished the rent must be closed by sutures—in itself an exceedingly difficult task, but one which is rendered easier by the abdominal wound already made, and which might be still further facilitated by a posterior enlargement of the anus by incision. After the rectal wound has been sutured the abdominal one may be closed, a tampon applied to the rectum, and opium with fluid diet administered; but the chances of a favorable termination of the case are very slight, the patient generally dying of collapse or peritonitis.

If the protruded bowel be greatly inflamed, and approaching gangrene in appearance, the surgeon must choose between replacing it and cutting it off. Nedham's fortunate result was evidently a lucky chance; but it cannot fail to strike the reader that had he insisted upon opening the abdomen and replacing the mass of inflamed bowel, instead of cutting it off as he did, the chance of recovery might have been much less. These cases in the future must be studied and treated in the light of the recent results of intestinal resection and the establishment of intestinal anastomosis. The condition will not, I venture to predict, long remain beyond the resources of surgical art.

The case last reported by Quénu is the first in which an effort has been made to suture the rent in the prolapsus, through

which the small gut has escaped, by means of a laparotomy. The operation, in spite of this failure, still seems feasible.

Mikulicz[1] recommends the following procedure for the removal of prolapsed rectum or intussuscepted colon, in cases in which such a plan of treatment is determined upon. In one case two feet and a half of prolapsed colon were amputated, the patient making a good recovery. The patient is placed in the lithotomy position. Two strong threads are passed through the extremity of the prolapse and looped for fixation. Irrigation should be continuous throughout the operation. A transverse incision is made through the anterior part of the prolapse, going carefully through its thickness, all bleeding being checked. When the serosa of the intussuscipiens is cut through, exposing the serosa of the intussusceptum, the two serous membranes are stitched together with a circle of fine sutures, thus closing all communication with the peritoneal cavity. Just beyond the sutures the anterior part of the intussusceptum is also cut through, and the two ends of the gut are now sutured together to the entire extent of the incision by silk threads, including all the coats. The threads are left long, and used to steady the bowel till the completion of the operation. Finally the remaining periphery of the two intestinal lumina is secured, the numerous mesenteric vessels tied, and the union of the gut completed by the deep sutures. The line of suture is dusted with iodoform, the long ends of the stitches cut away, and what remains of the prolapse reduced. No drainage tube or bandage is used, and opium is given for eight days.

[1] Deutsch. Gesellsch. f. Chir., xvii.

CHAPTER IX.

NON-MALIGNANT GROWTHS OF THE RECTUM AND ANUS.

Under this head will be included polypus, vegetations, condylomata, benign fungus, fibromata, lipomata, enchondromata, and the various forms of cysts.

Polypus.—A polypus may be defined as a benign tumor composed of one or more of the normal elements of the wall of the rectum; a hypertrophy either of the mucous membrane or of the submucous connective tissue. Those which are composed of the elements of the mucous membrane are known and generally spoken of as "soft" polypi; while those into which the submucous connective tissue enters are known as the "hard" or fibrous. In many works the former class are spoken of as the polypi of childhood, and the latter as those of adult age—a classification of little practical value.

The mucous membrane, as has been shown, is composed of villi, of the follicles of Lieberkuhn or tubular glands, and of occasional closed or solitary follicles. A polypus composed of an hypertrophy of the villi is well represented in Fig. 104.

A polypus of this variety may reach the size of a pigeon's egg; it is soft to the feel, and has a shaggy or cauliflower surface. On section the cut surface is of grayish-red color, the substance of the growth homogeneous, and the fluid which may be forced from it by pressure will be found to be full of cylindrical epithelium. A microscopic examination shows it to be composed of long, fine papillæ bifurcated at their extremities and covered by cylindrical epithelium.[1]

Although these polypi are generally small, Dr. Goodsall has reported a case from St. Mark's Hospital[2] in which the tumor attained the size of an orange. It was rough and tuberculated on the surface, and was attached to the rectal wall by a pedicle long enough to permit of its extrusion from the anus without

[1] Lücke: "Die Geschwülste: Handbuch der allgemeinen und speciellen Chirurgie," Pitha u. Billroth, p. 250.

[2] Lancet, May 21st, 1881, p. 828.

pain. It was attended by a frequent, copious, watery discharge, but never by any very free hæmorrhage at one time, and the patient showed no emaciation.

Villous Polypus (granular papilloma, Gosselin; villous tumor, Curling; villous polypi, Esmarch; "peculiar bleeding tumor," Quain). (Fig. 105.)

It is a question whether this form of growth should be classified with the polypi already described or with the warty growths whose description is to follow. It consists of an hypertrophy both of the villi and of the follicles of Lieberkuhn,

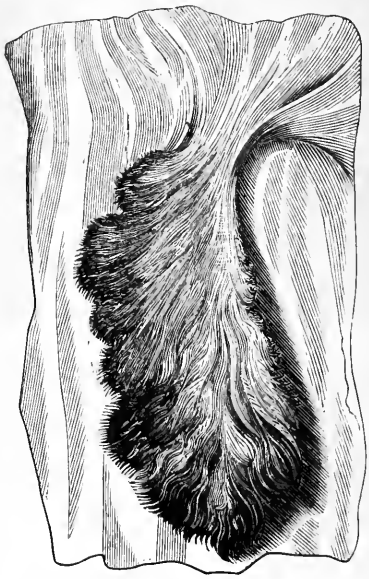

FIG. 104.—Rectal Polypus. (Esmarch.)

with a centre of connective tissue and generous vascular supply. According to the description given by Dr. A. Clark [1] of a specimen in the London Hospital Museum, the tumor is "essentially an outgrowth of dense areolar tissue, permeated by blood vessels, and assuming a papillary form, the papillæ being flattened and curled so as to represent hollow cylinders, and being clothed with layers of epithelium, the free layers being cylindrical."

These tumors are very rare; they have the feel of a large, warty polypus with cauliflower surface; are of red color; bleed easily; are of relatively slow growth, existing in Gowland's

[1] Curling, op. cit., p. 85.

case several years. They adhere to the wall of the rectum by a pedicle, sometimes composed chiefly of mucous membrane, and at others large, short, and fleshy.

The pedicle may be absent (Curling); and the growth will vary in structure according to the proportion of its different elements. It may reach the size of an orange.[1] It is found only in adults or in old persons, and the symptoms are the same as those caused by other polypi—viz., discharge and hæmor-

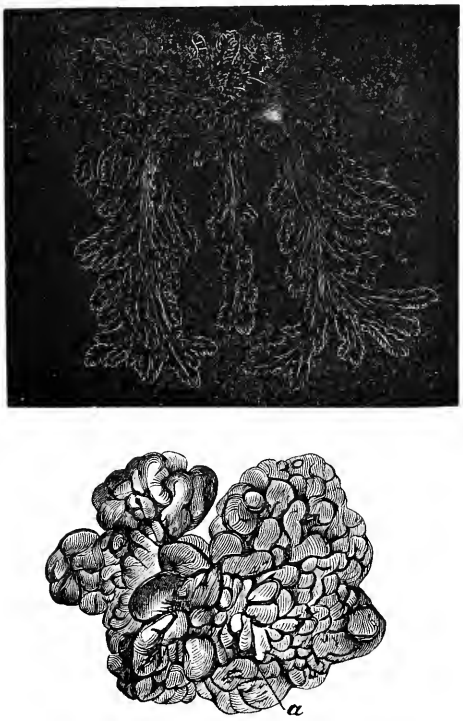

Fig. 105.—Villous Polypus. (Bryant.)

rhage; but the hæmorrhage is not a constant symptom, and varies greatly in frequency and amount in different cases.

Glandular Polypus.—The adenomatous polypi, or those developed from the glands of the mucous membrane, are well shown in Fig. 106.

These may be due either to an hypertrophy of the follicles of Lieberkuhn or to an hypertrophy of the closed follicles. They occur most frequently in young persons; are generally of the

[1] Syme: "Diseases of the Rectum," 2d ed., p. 82.

size of a small plum, rarely reach that of a pear, and yet Esmarch reports one weighing four pounds.[1] They are very vascular tumors, and therefore of reddish color. They are sometimes smooth on the surface, but oftener mammillated, like a strawberry, and are attached by a pedicle, most often to the posterior wall, but occasionally to the sides of the rectum, and at a point generally within reach of the finger, but sometimes higher up. They may, indeed, occur anywhere along the large intestine as high up as the ileo-cæcal valve.

The pedicle is generally large and short, and not long and slender as in the case of the fibrous polypi soon to be described;

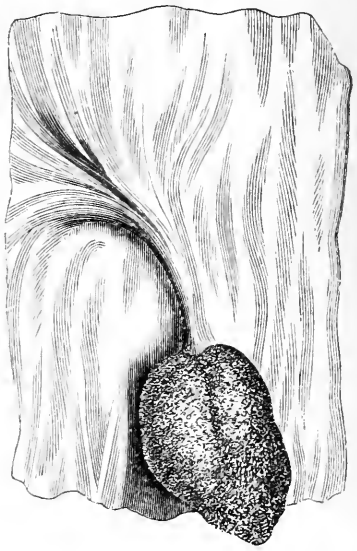

Fig. 105.—Glandular Polypus. (Esmarch.)

but there are frequent exceptions to this rule, and these tumors will sometimes be spontaneously expelled by rupture of the slender pedicle in defecation.

The pedicle is also sometimes double (Smith). It consists of mucous membrane covering the vessels which carry the blood to the tumor and return it again—an artery and generally two veins, but, when the tumor is very large, sometimes two arteries and a collection of veins.

Polypi which consist of an hypertrophy of the closed follicles of the rectum are often found in considerable numbers. Fo-

[1] Op. cit., pp. 176, 177.

chier[1] removed several hundred of them from a patient aged eighteen, and Richet[2] from sixty to a hundred in a man aged twenty-one. Van Buren[3] speaks of the same condition, adopting Broca's name of "polyadenomata." To this variety of polypus belong also certain cysts (closed follicles) distended by viscid and transparent fluid; and Bathurst Woodman has reported one such case in which the cyst was lined by a membrane similar to peritoneum.

On section these adenomatous polypi are found to contain much viscid fluid, full of cylindrical epithelium and rudimentary glandular tubes. Under the microscope a vascular stroma of connective tissue will be found, in which there are enlarged glandular tubes, sometimes branching at their extremities, and also cystoid spaces filled with reddish, viscid fluid (Esmarch).

The microscopic appearances of a section of such a polypus are shown in Fig. 107.

The following is an unusually interesting case of this variety:

Recurrent Adeno-papilloma of the Rectum.—A lady, sixty-four years of age, had had rectal trouble for five years, and during the last year or two had been operated upon five times for the removal of a growth which seemed to her to fill up the rectum, and caused her such discomfort that she "must have it taken away." The patient was in good general condition, and there had been no deterioration in health. She was still stout and well; there was no protrusion from the anus at stool, no pain, and no discharge. The growth, which had been so frequently removed, had been examined more than once by expert microscopists and pronounced of non-malignant nature.

On examination a space on the posterior wall of the rectal pouch well within the internal sphincter, extending about three inches longitudinally and two inches laterally, was found covered with soft, gelatinous polypi. The number of the growths may be roughly estimated at from fifty to one hundred, varying in size from that of a pea to that of a plum. They seemed each to grow from an individual pedicle which was very soft and easily torn off by the finger. The tumors themselves were very soft and jelly-like, having scarcely sufficient body to hold together when seized with the forceps. The mucous membrane from which the polypi sprang seemed healthy; there was no thickening and no hardness of the rectal wall. Some cicatricial

[1] Mollière, p. 362, note.

[2] "Traité Prat. d'Anat. Méd.-Chirurg," 4th ed., Paris, 1873.

[3] Op. cit., p. 103.

contraction had been caused by the frequent use of pure carbolic acid to the diseased surface after the removal of the growths.

On first examining the patient I found the rectum partially filled with the growths as described, though they had been, partially at least, scraped off with the curette only three months before. Wishing to effect a cure if possible, I gave ether, scraped the surface as perfectly as possible, and cauterized it with Paquelin's cautery. The amount of new growth removed would have filled a small tumbler, but it was very fragile, soft, and gelatinous ; some pieces were as large as almonds, the rest a mere mass of hypertrophied mucous membrane. This being the sixth operation, but the first by myself, I did it as thoroughly as possible, in the hope that no recurrence might take place.

The patient did not make as easy a recovery from this operation as from the previous curettings, and was in feeble health for some months. The interval, however, between removal and return was considerably longer, and for six months she did not demand another operation. At the end of that time the growth was once more thoroughly scraped off and the base painted with carbolic acid ; the patient being in poor condition for a partial exsection of the rectum, which seemed to be the only method of radical cure. The amount removed seemed fully as great as at the last operation, and the surface affected, if anything, more extensive. From this operation the patient made a good recovery, and for three months enjoyed better general health than for some time before.

At the end of that time she again presented herself for operation, and the tumors were once more scraped out, this making the eighth time. The disease had changed slightly in gross appearance. The size of the affected surface was the same, but it seemed more thickly covered by the polypi, and these were less distinctly pedunculated, and none of them had reached the dimensions usually attained by three or four of them in the same length of time. The part was thoroughly scraped with the sharp spoon.

The following is the report of the microscopic examination of the tumor:

"I find the growth to be an adeno-papilloma. Its surface is covered with thickly set, delicate, rarely branching papillæ which are composed of connective tissue and blood vessels and are covered by high, cylindrical epithelial cells. In the deeper parts are branching tubes lined with cylindrical epithelium.

The stroma of the tumor is rich in young cells and highly vascular.

"This tumor is usually ranked as non-malignant, but it seems to lie on the borderland between the benign and malignant growths. It often returns upon removal, but rarely produces metastases. WILLIAM H. WELCH."

The growth was removed several times subsequently, and the patient dying of an intercurrent affection, the rectum was sent

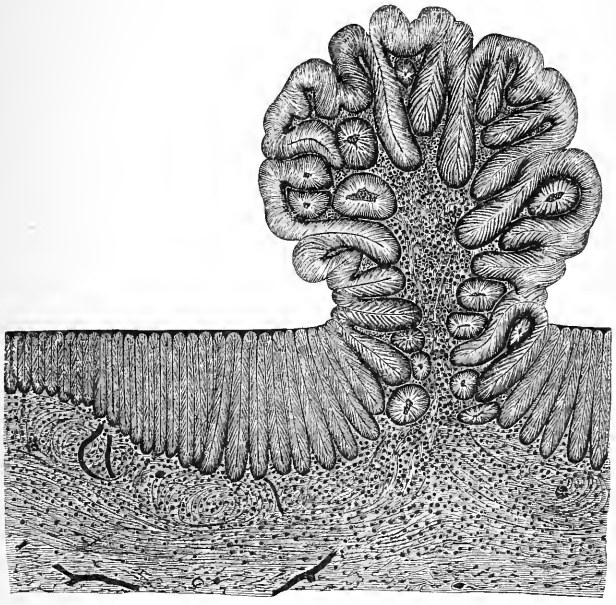

FIG. 107.—Vertical Section of Glandular Polypus. (Esmarch.)

to me for post-mortem examination. It was, however, considerably softened, and whatever tumors may have existed at the time of death had apparently been broken off by handling. The changes in the rectal wall were so slight that it was with difficulty the site of the disease could be discovered.

Fibrous Polypus.—The hard or fibrous polypus (sarcomatous polypus, Esmarch), which is composed primarily of the elements of the submucous connective tissue, is much rarer than the soft variety, and is most commonly found in adults, where it may be isolated or multiple. It is chiefly composed of fibrous tissue, and resembles the uterine fibroid; but it may contain both muscular

and glandular elements. When the glandular elements are filled with fluid which resembles glue, these tumors have been known as colloid; and when cysts are found filled with jelly-like substance, the name myxoma has also been applied.

These hard or fibrous polypi vary greatly in their degrees of hardness to the feel, according to their turgescence and their composition. They may creak under the knife on section, and look very much like hypertrophied and œdematous skin, or they may resemble the better-known nasal polypus in their consistence.

The connective-tissue fibres are generally irregularly disposed, and cross each other in every direction, though a regular stratification, such as is seen in uterine myxomata, may be

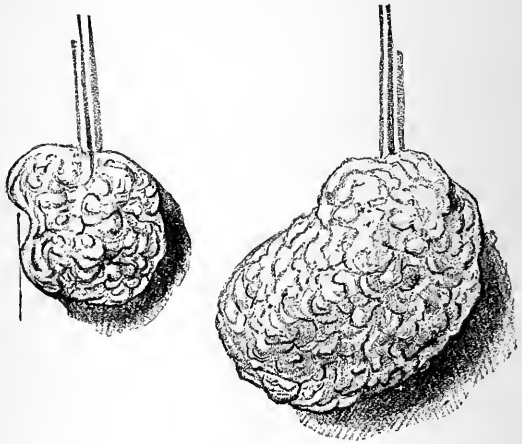

Fig. 108.—Fibrous Polypi.

present (Esmarch). When seen in the rectum before removal, the surface is generally red from their vascularity; but after removal they are pale, and generally smooth, though sometimes uneven and irregular in surface, and covered with hypertrophied papillæ. The mucous membrane is generally easily stripped off, though if there has been local inflammatory irritation it may be firmly attached. The vascular supply is abundant, and distributed both to the substance and surface of the tumor. This accounts for their rapid development.

The pedicle is generally very slight, and is formed mechanically by the traction of the growth on the mucous membrane beneath which it is located. It is composed, as in the soft variety, simply of mucous membrane and blood vessels. There

may, however, in a case where the pedicle has been formed by traction upon and prolapse of all the coats of the bowel by a tumor located primarily above the reflexion of the peritoneum, be a peritoneal *cul-de-sac* within the pedicle.

An hypertrophy and increased vascularity of the mucous membrane at the attachment of the pedicle has been noted in certain cases.

If left to its natural course, the pedicle gradually becomes longer and more slender, and finally ruptures in the act of defecation, and in this way a patient may relieve himself of the growth.

These tumors are benign in character, and when once removed do not generally return at the same point. They may, however, recur, if not at the same point, at one very near it, and the same patient may be relieved of a succession of them.

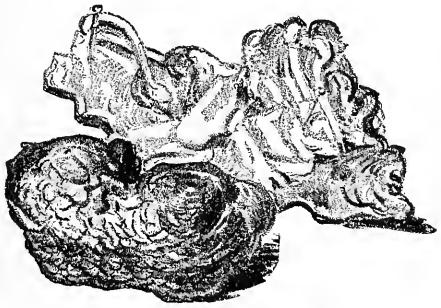

FIG. 109.—Fibrous Polypus with Mucous Membrane Attachment.

Quite recently I was called upon to remove three of these growths from the rectum of a brother practitioner, in whom they had been growing nearly twenty years. (Fig. 108.) At each act of defecation two of them were protruded, one the size of a hen's egg and the other not much smaller. They were hard to the touch, very painful when handled, perfectly white, and without any trace of vascularity on the surface, and attached by large and strong pedicles, one on each side of the rectum, about an inch above the anus. The third one was much smaller and was attached posteriorly. Under the microscope they were found to consist chiefly of fibrous tissue arranged irregularly, though in parts the sarcomatous element was well marked. The mucous membrane which originally covered them had entirely disappeared, though they were described as having at one

time been very vascular on the surface—so much so that when extruded in defecation the blood spirted from little papillæ in numerous jets. Fig. 109 represents another tumor removed from a middle-aged man, in which case a diagnosis of malignant disease had been made.

Symptoms.—A rectal polypus may exist for many years and give no sign of its presence. The two chief symptoms which it is apt to excite are hæmorrhage and discharge. The hæmorrhage may be a daily occurrence, or may be present only at long intervals, and it may vary in amount from a few drops to a quantity which shall cause grave disturbance and alarm. When the mucous membrane covering the tumor has once become ulcerated, the hæmorrhage will be frequent and the discharge will be more or less fœtid. The vessels are apt to bleed freely when opened, because of their being embedded in fibrous tissue and of their inability to contract. When the tumor is so high and the pedicle so short as to be beyond the grasp of the sphincter, there is no suffering unless the irritation of the growth has set up a catarrhal proctitis; but after prolapse once begins to take place the suffering may be very severe. The sphincter may become dilated and relaxed, or the pedicle may be firmly grasped by it after the act of defecation, and a cure may result from the strangulation thus caused.

The discharge from the rectum which a polypus may cause is sometimes extreme in amount and constant, escaping not only at the time of defecation but at frequent intervals between, and being of an excessively fœtid character. This discharge may, by its irritating qualities, cause secondary congestion of the rectal mucous membrane, erosions around the anus, vegetations, constant diarrhœa, and tenesmus ; and, joined with the loss of blood, the condition of the patient may be easily mistaken for that of chronic dysentery or even malignant disease.

There are several points worthy of attention in examining a patient for this disease. It is a good plan, as suggested by Chassaignac, to first administer an enema of water before making the examination, that the polypus may float freely in the distended rectum. The finger is in the vast majority of cases all that is necessary for the examination ; and, as Mollière suggests, the examination should be made from above downward, and not, as is usually the case, from below upward. In the former case, by passing the finger up along the anterior wall and withdrawing it along the posterior, the tumor may easily be caught in the descent after the pedicle has been put upon the

stretch, while in the latter case it may easily be carried up the bowel and escape detection altogether.

Diagnosis.—Hæmorrhage from the rectum in a child, with or without pain on defecation, generally means polypus; and it often means the same in an adult, though it will oftener indicate hæmorrhoids. The secondary symptoms, which seem to point to dysentery, must never cause the original disease to be overlooked. There is, in fact, but little difficulty in the diagnosis of a polypus in the vast majority of cases; but once in a while, where the attachment is broad and the pedicle not well marked, the question of benign or malignant growth may arise and be difficult to solve except by the subsequent history and development of the case.

In the chapter on Cancer attention will be called to the fact that the distinction between epithelioma and a benign polypus of the adenoid variety cannot always be made by the microscopic examination; and we here emphasize the fact that the diagnosis must rest both upon the clinical history and gross appearances, and upon histological investigation of the growth when removed. In children malignant disease is so rare that the chances are greatly in favor of benignity. Malignant growths, moreover, do not tend to spontaneous extrusion and are not pedunculated, and the presence of a pedicle is therefore greatly in favor of benignity. But given an adult with an adenoid polypus which has ulcerated and which is not pedunculated, and the diagnosis between it and malignant disease may be impossible, either by the microscope or the clinical history; for the ulcerated and bleeding tumor may cause a wasting and cachexia which strongly resembles cancer. A soft polypus may also be mistaken for an internal hæmorrhoid when no pedicle is present, but the point of attachment is different in the two cases.

Treatment.—The treatment of polypi is generally a simple matter, and consists in their extirpation, after which they rarely return. There are two dangers to be considered: the first is that the pedicle, when a pedicle exists, may contain large vessels; the other is that it may contain peritoneum. The extirpation of a polypus which has come down from its attachment in the sigmoid flexure, has been followed by death from wounding the peritoneum, at the hands of no less a surgeon than Broca. Where the pedicle is long and slender, the polypus may generally be twisted off by simple torsion without danger. It is generally safer, however, first to apply a ligature and then cut away the tumor. Should there be no pedicle, the mass must be

extirpated as any tumor would be, and the hæmorrhage which occurs must be treated upon general surgical principles.

Vegetations.—These growths, known also by the names of warts and papillomata, may be defined histologically as an hypertrophy of the papillary layer of the skin, and of the papillary layer only. They are composed of the connective tissue, the

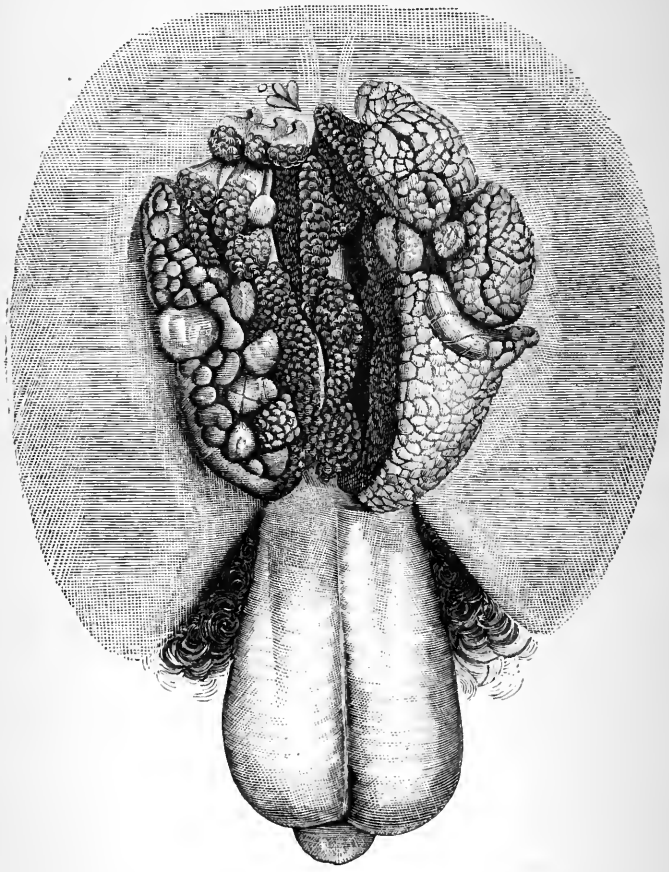

FIG. 110.—Non-syphilitic Vegetations. (Esmarch.)

epithelial covering, and the blood vessels, which, in their natural quantities, form the papillæ of the derma.

The gross appearances of these warty growths are represented in Fig. 110.

Under the influence of any of the exciting causes which will soon be mentioned, little tumors resembling ordinary warts ap-

pear, and grow rapidly till they reach two or three millimetres in size. The extremity of the tumor shows a decided tendency to branching and bifurcation, and when there are many of them their branching extremities may fuse together and form a large, flat tumor, which will be attached to the skin, however, by numerous little pedicles, so that, if shaved off, the skin will not be wounded except in numerous small points where the pedicles have had each its independent attachment.

When the wart is isolated it is dry, but when several are united they become macerated in the secretion of the part, which decomposes between them and gives rise to inflammatory phenomena. The tumor then becomes moist and fœtid, and all the adjacent parts become irritated. According to the size of the growths, the condition of the patient, the abundance of the secretions, and the irritation to which they are originally due, these vegetations take on various shapes, and have been described as cock's-combs, cauliflower excrescences, etc., etc.; but the elementary structure of them all is the same—an hypertrophy and branching of the papillæ of the derma.

On placing a longitudinal section of one of these warts under the microscope the following structures will be seen: In the centre, a framework of connective tissue composed of a prolongation of the papillary bodies of the derma ; in the centre of this, a vascular loop ; the whole covered by one or more layers of epithelium, the form and size of which are variable and depend apparently on several conditions, such as the moisture and dryness of the parts and the amount of pressure to which the growths are subject. When the connective tissue is abundant and the epithelial layer relatively thin, the vegetations are dry and hard. When the conditions are reversed, they are moist. When the vascular network is greatly developed, the tumors are red and turgescent, and bleed easily.

The growth occurs from the cells of the proliferating zone, between the summit of the papilla and the epithelial covering. The intercellular substance of the connective tissue becomes less abundant, while the cellular elements increase and mingle above with the epithelial layer, and below with the connective tissue. Similar proliferating zones may be seen on the lateral surfaces of the ramifying warts, and, through their medium, the ramifications develop at the extremity of the wart, while on the level with the proliferating zones the capillary loops grow and develop, by which the afferent and efferent vessels communicate (Rindfleisch, Mollière).

These vegetations were formerly considered as proof positive of the existence of syphilis, and even of sodomy, and were treated as such. Mollière[1] relates how, at the time of Dionysius, there was a special hospital at Rome for the treatment of these growths; and Dionysius himself tells how the surgeons spared neither the iron nor the fire, and were not moved to pity by the cries of the patients, inasmuch as this disease was the result of unnatural intercourse between man and man.

The same false idea has lasted until the present time, and is even now far from unpopular; and yet the independence of these growths upon syphilis would seem to be beyond question, except to the extent that any syphilitic sore in this neighborhood may, by the irritation of its discharge, cause their production. They owe their growth, in the first place, as pointed out by Diday,[2] to a special predisposition to the formation of warty growths on various parts of the body in the individual, and this predisposition is assisted by the presence of any irritation of the part. Thus the discharge from a gonorrhœa or a leucorrhœa, or any disease of the rectum or genitals, may cause them to grow, and they may appear in persons apparently perfectly healthy and cleanly. Pregnancy has an undoubted influence upon their production, and they sometimes disappear spontaneously after delivery. From what has been said it is evident that these growths are neither contagious nor inoculable, and that antisyphilitic treatment can be of no avail.

Symptoms.—These vegetations may occur at any age from infancy to adult life, though they generally belong to the latter period. They may vary in size and quantity from a single enlarged papilla at the verge of the anus to a mass such as is represented in the plate, and which weighs as much as a pound. The symptoms, in any case, will vary with their size, number, location, and the amount of the secretion. When they grow from one side of the intergluteal fold, and are large enough to press with their moistened surface upon the corresponding point of the opposite side, a second patch may be developed at the point of contact. The irritation from any other source would have the same effect. The development of the growths may be slow or rapid, and when the tumors are of large size the patient is constantly troubled by the feeling of a foreign body, by a sanious and foul-smelling discharge, and by fresh erosions and

[1] Op. cit., p. 506.

[2] "Exposition critique et pratique des nouvelles Doctrines sur la Syphilis," Paris, 1858.

superficial ulcers in the adjacent parts. Great pain in defecation may be produced by a small wart situated just at the verge of the anus, and such a little tumor may give rise to all the characteristic symptoms of a painful fissure, including a slight discharge and an occasional drop or two of blood. They are not very infrequent on the line of junction of the mucous and cutaneous surfaces, just within the verge of the anus. They may also spring entirely from the mucous membrane, above the sphincter, though they are generally confined to the first inch of the canal, and in such cases give rise to a much more aggravated train of symptoms and to much difficulty of diagnosis. There they are generally smaller and harder than when on the cutaneous surface, and cause a serous discharge, which may be so profuse as to escape from the anus between the acts of defecation, and cause much suffering from pruritus and rectal tenesmus.

On examination in such a case the mucous membrane will be found dry and glistening, as a rule, though sometimes there may be a more or less extensive proctitis ; and the little, hard, tender, warty excrescence, which is the cause of all the grave train of symptoms and of so much suffering, may easily escape detection. The only treatment for such a condition is to seize the little tumor with the toothed forceps, and excise the mucous membrane to which it is attached. It may, however, return many times.[1]

Diagnosis.—The diagnosis of these growths is not generally difficult, though care is necessary when they are small and located within the grasp of the sphincters. The mistake most commonly made is to consider them as syphilitic condylomata ; and, indeed, they may not always be easily distinguishable from the raised mucous patch or flat condyloma which is a manifestation of true syphilis. A careful examination of a raised mucous patch can scarcely fail, however, to show the difference between its general character and that of a cauliflower growth which has sprung up from the surface like a shrub and is attached to it by numerous little pedicles. The two may exist simultaneously, the wart being caused by the irritation of the discharge from the other. There is little danger of mistaking these vegetations for malignant growths, though they have been known to assume a semi-malignant, epithelial character, and to return frequently after removal.

Treatment.—The surest, most rapid, and in every respect most

[1] " Des Verrues de l'intestin rectum," Rognetta, Gaz. méd. de Paris, June, 1835.

satisfactory way of curing these vegetations is by simple excision with the knife or scissors. The ligature is often inapplicable, and cauterization is not always easy to limit in its action. The growths may, however, often be induced to dry and shrink up by applications of powdered alum or tannin, and by washing with astringent lotions, such as Labarraque's solution.

There are frequently seen around the anus growths of skin which are attached by a broad base, are pinkish in color, soft, fleshy, glistening, moist, and irregular in shape, flattened where two are pressed together, or where one is subjected to the pressure of the buttocks, and which generally give out a slight secretion. (Fig. 80.)

They generally have one of the radiating folds of the anus as their point of origin, and they differ from the class of vegetations last described in that they consist of an hypertrophy of the whole thickness of the skin, and not alone of the papillæ. The epithelial element in them is not as marked as in the warts, and the blood vessels are also less developed. They are merely the result of a localized chronic inflammation and thickening of the skin, and often follow an external hæmorrhoid or any local irritation such as has been spoken of in connection with vegetations. They are generally isolated and few in number; but it may happen that after the irritation to which they owe their origin has ceased, the growth may continue, becoming harder and more movable, and resembling a true fibroma. Such a hard tumor may, under sufficient irritation, take on an ulcerative and suppurative action, its size all the while increasing, until a foul, painful, indurated mass results which strongly resembles malignant disease. Paget[1] once said that, without considering these growths as absolutely and always syphilitic, they are so rare without it that, as yet, he had not seen a case. They are a very common accompaniment of any ulcerative process within the rectum, and hence of stricture; and many a stricture has been untruly stamped as syphilitic because the discharge from the anus had caused a development of these fleshy tags. They are indeed common in syphilis of this part, but they are not syphilitic.

These tumors, which are often improperly called condylomata, occasionally reach a large size, as in a case recently reported by Dr. Barnes.[2] The tumor in his case was the size of an ordinary orange, and had been protruded from the anus during labor. It

[1] Medical Times and Gazette, vol. i., 1865, p. 279.

[2] British Medical Journal, April 12th, 1879.

proved to be a dense growth attached to the margin of the anus, the rest of the anal circumference being surrounded by piles more or less indurated. At one point the tumor was greenish, as if about to sphacelate. It was removed by galvano-cautery. It had a broad base, and Dr. Barnes looked upon it as an outgrowth from a hæmorrhoidal tumor. Dr. Goodhart reported it as, for the most part, composed of loose fibro-cellular tissue, covered by a tough and altered mucous membrane; the deep parts were, however, cavernous in structure. He was of opinion that it originated in some chronic overgrowth of connective tissue round a pile.

The diagnosis of these growths is generally easy. They can

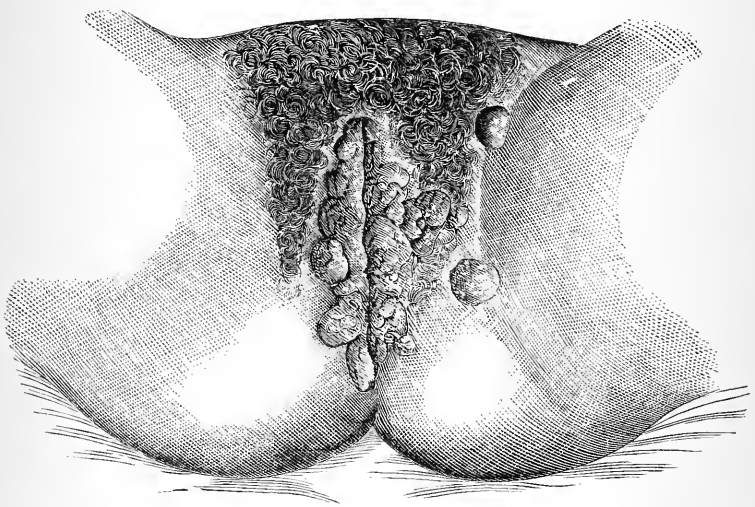

Fig. 111.—Condyloma Lata, or Vegetating Condyloma. (Bumstead and Taylor.)

scarcely be mistaken for aught except a syphilitic gummy deposit or malignant disease, and they are not apt to be confounded with either. I have seen malignant deposit, however, mistaken for simple condyloma, and treated by mercurials, ablation, and the hot iron, it is needless to say without benefit.

There is a variety of mucous patch situated upon the skin near the anus to which the name condyloma lata, or vegetating condyloma, can alone be properly applied.

The syphilitic condyloma first manifests itself as a red spot and by a slight effusion beneath the epidermis, which is soon rubbed off by friction, exposing a raw surface, generally covered by a grayish pellicle. This surface is subsequently elevated

by an upward growth, and by branching of the papillæ, with formation of connective tissue and dilatation of the blood vessels. Where this development of the papillæ has reached a considerable extent, the cauliflower appearance is the result, and what was at first a simple mucous patch may become a large pedunculated wart surrounded by other vegetations which have sprung up around the original lesion, and which are due to the irritation of its presence (Bumstead and Taylor, Keyes, Bäumler).

It may be impossible to distinguish this form of syphilis from the simple vegetation already described, except by the history, the fact of its infectiousness, and the results of treatment. Under the microscope both are composed of an hypertrophy of the papillæ of the derma. It ought not, however, to be difficult to distinguish between this syphilitic mucous patch and the simple hypertrophy of the skin, such as is seen at the site of an old external pile, to which we here limit the name of condyloma.

This loose and undefined use of the word condyloma is much to be regretted, but is so common as to make any change out of the question. It is used here to denote only one form of growth, the syphilitic mucous patch.

Benign Fungus.—Under this title Mollière [1] describes a granular condition of the mucous membrane of the lower end of the rectum occasionally seen in children as a result of prolapse. It is composed of soft, friable, vascular tissue, identical with the granulations of a cicatrizing wound. The surface of the mass is red and uneven, the base is marked by dilated veins. After defecation the tumor may remain prolapsed, but it is easily reducible, and when prolapsed is not painful, which is a distinguishing mark between it and polypus. The hæmorrhage attending this form of growth is always abundant and may cause much wasting. On account of this hæmorrhage the growth is best treated by cauterization and astringents.

Fibromata.—True fibrous tumors may develop outside of the anus. Curling [2] gives a description of one such case removed by Mr. Hovel, of Clapton, which had been growing for seven years and weighed upward of half a pound. It was composed of fibrous tissue arranged in several lobes, was pendulous and attached to the margin of the anus by a narrow neck. The surface was ulcerated from friction. He remarks that they seldom

[1] Op. cit., p. 524.
[2] Op. cit., p. 188.

exceed the size of a chestnut, and that their surface is generally irregularly lobulated.

Lipomata.—Of these fatty tumors there are only a few scattered cases in literature from which to derive a general knowledge of their characteristics in this part of the body. Esmarch[1] speaks of two cases, one observed by Weiss, the other by Bose. The former occurred in the surgical clinic at Prague; its size was that of a plum, and it had caused an invagination of the sigmoid flexure into the rectum and a prolapse nearly four inches in length. After extirpation of the tumor and ligature of the pedicle, the prolapse was reduced and the invagination overcome by forced injections. The second case was somewhat similar and occurred in Langenbeck's clinic. Mollière[2] gives two cases in full. One from Cl. Bernard[3] in a woman eighty-three years of age, who complained of obstinate constipation and dyspepsia, and a sensation as of the weight of a foreign body in the rectum. By making a digital examination upon herself she could feel the tumor, and she soon succeeded in evacuating it. It weighed twenty grammes, was about the size of a pigeon's egg, was composed entirely of fat, and had a distinct and slender pedicle. The other case,[4] reported by Castilain, occurred in a man aged forty-three, who complained of the same symptoms of constipation and dyspepsia, and this also was expelled spontaneously by the straining of the patient. The doctor at first supposed the mass to be a ball of hardened fæces, but a closer examination proved it to be an ovoidal tumor measuring twelve centimetres in length by six in thickness. The consistence was firm, and the section reddish in color. The tumor showed numerous lobules and was enveloped in a resisting envelope. At one end there was a distinct pedicle two or three centimetres long, and slender. Spencer Wells[5] has also reported a large, lobulated fatty tumor, weighing two pounds, which he removed from the recto-vaginal septum.

Fatty tumors may also occur in the region around the anus and encroach upon it to a greater or less extent. Molk,[6] in his

[1] Op. cit., p. 154.

[2] Op. cit., p. 525 et seq.

[3] Azefou: Bull. de la Soc. anatomique, séance du Mars 26, 1875.

[4] Gaz. hebdomadaire, Mai, 1870, p. 318, et Bull. Méd. du Nord de la France, Mars, 1870.

[5] "Transactions London Pathological Society," vol. xvi., p. 277.

[6] "Des Tumeurs congénitales de l'Extrémité inférieur du Tronc," Thèse de Strasbourg, 1868, No. 106.

well-known thesis, gives several such examples. They may be divided into the pedunculated and non-pedunculated. The former occurs especially in children, and is easily removed by knife, scissors, or galvano-cautery wire, and generally without great danger. The non-pedunculated variety is much rarer. Molk relates one, in a still-born child, which filled the pelvis and descended to the calves of the legs. Robert[1] has recorded another in which the tumor sprang from the ischio-rectal fossa, and was at first mistaken for a perineal hernia. It occurred in a riding master, forty-five years of age, and measured ten centimetres by seven. The operation at first consisted in cutting down upon the tumor, layer by layer, as in the case of a hernia; but as soon as its true nature was evident it was followed into the ischio-rectal fossa and extirpated. The patient was well in a fortnight.

Virchow[2] has made a study of these intestinal fatty tumors, from which the following general facts may be derived. The fatty tissue of which they are composed is apt to undergo inflammatory changes by which the general appearance of the tumor is changed, so that when it appears at the anus it may seem like a hard, fleshy tumor of dark-red color on section. Another result of the irritation to which they are exposed is the formation of a hard crust on their surface, which may finally become cartilaginous and cause them to be confounded with fæcal calculi. Instead of an inflammatory hardening, a central softening may occur, and a cavity be formed containing free liquid fat. Cretaceous masses may also be found in the centre of the tumors.

In general these tumors are attached high up the bowel, and hence the pedicle may contain peritoneum. They are very apt to cause invagination, as in Esmarch's case, and this coincidence should always be borne in mind when one is found presenting at the anus.

Enchondroma.—Cartilaginous tumors of the rectum proper are of exceeding rarity, and when found they are generally the result of a secondary change in a tumor primarily glandular, and do not therefore present the well-known characteristics of the typical enchondroma. M. Dolbeau has reported[3] a case of enchondroma of the lower part of the rectum, removed from a

[1] "Lipome de l'Anus simulant une Hernia périnéale," Annales de Thérapeutique, Octobre, 1844.

[2] "Pathologie des Tumeurs," Translation par Aronssohn, vol. i., chap. 14.

[3] Bull. de la Soc. Anat., second series, t. v., p. 6.

young man aged twenty-seven. The tumor was the size of a hazelnut, was hard and movable, and located at the entrance of the anus, where it caused no pain except when a sound or syringe was used. Around the tumor the mucous membrane was eroded. The microscopic examination showed a predominance of the fibro-cartilaginous element with glandular *culs-de-sac*, in the proportion of one to four. M. Dolbeau did not believe that the tumor was developed from the glands of the rectum, and Robin thought that the glandular elements of the tumor were of new formation.

Cysts.—Cysts in the neighborhood of the rectum and anus may be of many varieties. Of the dermoid there are several recorded examples. At a meeting of the London Pathological Society, May 18th, 1880, Dr. Port [1] showed a tumor he had removed from the rectum of a girl aged sixteen. It was mainly composed of fibrous tissue enclosed in an integument like ordinary skin, covered with long hair, and containing abundant involuntary fibres like those seen in the normal cutis. Growing upon it also was a well-developed canine tooth. The author refers to a somewhat similar case, recently reported in Germany, in which the tumor contained not only a tooth but brain substance.

Danzell [2] reports a case in a woman, aged twenty-five years, in whom a lock of brown hair, the size of the finger, protruded from the anus occasionally after defecation. In the front wall of the rectum, about two and a half inches from the anus, a hard tumor could be felt about the size of a small apple. This was extirpated by introducing the whole hand into the rectum, after Simon's method, death following some months after from localized peritonitis.

The hair growing from this tumor was from 12 to 18 cm. long. The tumor itself, when extirpated, measured 4.5 cm. in length, 4 cm. in breadth, and 3.5 cm. in thickness, and the microscopic examination showed the usual cyst wall and contents.

Perrin [3] gives an account of three cases of these tumors, which may be briefly extracted.

Case.—*Congenital Tumor.*—Woman, aged thirty years. First noticed small tumor at point of coccyx a few months after confinement. Tumor round, elastic, well defined, firmly adhe-

[1] British Medical Journal, May 29th, 1880, page 811.

[2] "Geschwulst mit Haaren in Rectum," Arch. für Clin. Chirurg., 1874, page 442.

[3] "De la Glande coccygienne et des Tumeurs dont elle peut-être le siége." Strasbourg, 1860, Thèse No. 536.

rent to point of coccyx, painless to the touch, but more sensitive at menstrual epochs and when the patient was in sitting posture. At this time it was the size of a small nut, but a year later it had increased considerably and extended from the anus to the sacrum; it gave a sense of fluctuation to the touch, and was unattached to the skin. Defecation painful. The sac of the tumor was extirpated, after its steatomatous contents were emptied, without difficulty. It was adherent by fibrous tissue to the point of the coccyx, but not elsewhere. The examination after removal showed it to be about the size of a hen's egg, with the large extremity turned toward the anus. It was composed of an envelope and contents. The envelope was composed of two distinct layers: the outer, fibrous and elastic, and showing the elements of cellular tissue under the microscope; the inner, thin, transparent, and resembling a very thin layer of cartilage. Under the microscope this transparent layer was composed of flattened, transparent, polygonal epithelial cells about one-fortieth mm. in diameter.

The contents of the sac consisted of whitish matter, disposed in layers at the circumference, but mingled in a tallowy mass in the centre; seen under the microscope to be composed of epithelial cells filled with fatty matter. Cure.

Case. — *Congenital Tumor.* — Woman, aged twenty-seven years. This tumor had been growing for five years. It first appeared as a small tubercle about one-third of an inch in size, very hard and painless, at the left side of the coccyx. For the first three years it was painless, but during the latter two had caused more uneasiness when struck or pressed upon. After a time the pain was increased, and became continuous, with remissions and exacerbations, and the size began to increase, while the surrounding parts took on an inflammatory action. The pain followed the course of the sciatic nerve on the side of the tumor, and after a while it became impossible to lie on the back or to walk. At this time the tumor had increased to the size of a child's fist and rested on the left sacro-sciatic ligament. The skin and subcutaneous tissue over it were healthy and not adherent. The tumor itself was hard and somewhat elastic, and adherent to the subjacent parts.

The tumor, having been completely separated by enucleation and dissection from surrounding parts, was cut away with curved scissors, care being taken to cut the osseous portion as much as possible in a longitudinal direction. The excised portion presented a fibrous shell, like that of a cyst, containing in

its upper part a caseous, grayish substance which increased in consistence in proportion as it neared the base, where it was of fibrous hardness and appearance, then became fibro-cartilaginous, and at the base, where it was adherent to the bony outgrowth from the coccyx, it was almost cartilaginous. The interior of the tumor was perforated with spaces enclosing a liquid matter resembling pus. Cure.

Case.—Man, aged twenty-four years. Fibrous cyst, size of a pigeon's egg, filled with liquid contents. Cure.

Mollière also reports one case of his own, in a young girl in whom the tumor, the size of a small almond, was covered by healthy skin.

Walzberg [1] also reports an interesting case of operation. The patient was a woman, aged twenty-six years, from whom a congenital tumor the size of the two fists was cut. A prolongation was found extending so far into the pelvis that it could not be followed to the bottom. The patient recovered from the operation with a deep pelvic fistula remaining.

From these cases the general characters of these tumors may be deduced. They are generally soft, pasty, indolent, covered by healthy skin to which they are not adherent, and firmly attached to the sacrum or coccyx. They occur most frequently in adults, and seldom attain any size larger than that of a hen's egg. They grow slowly for a longer or shorter time until an inflammatory action is excited, when acute symptoms supervene and they demand attention. They may contain sebaceous matter, hair, or teeth, and may be located even within the rectum, which is very rare, or in the ano-coccygeal region, which is more common.

While speaking of tumors containing hair, etc., it may be well to refer to an affection which Dr. Hodges,[2] of Boston, has described under the name of "pilo-nidal sinus" (pilus, a hair; nidus, a nest), and which has for some time been known in French literature by the name of the posterior umbilicus. The affection is simply a ball of hair and dirt in a sinus between the anus and the tip of the coccyx. The sinus is a deep, symmetrical, somewhat conical dimple of congenital origin, representing an imperfect union of the lateral halves of the body, involving the integument alone, in which, as life advances, short hairs and other particles accumulate. These, by their irritation, cause a purulent discharge from the fistulous opening of the

[1] Deutsche Zeitsch. f. Chir., t. x., Nos. 5 and 6, November, 1878.

[2] Boston Med. and Surg. Journal, November 18th, 1880.

cavity, and when the case comes under the observation of the surgeon it is usually mistaken for fistula in ano. The hair being removed, the sinus closes by granulation.

This affection is never found in children, never in men who do not have a large amount of hair about the nates, and so rarely in women that the records of the Massachusetts General Hospital included but a single instance, and in this patient there was, for a female, an unusual growth of hair. For the development of the affection there are necessary a congenital coccygeal dimple, an abundant pilous growth (hence adult age, and almost of necessity the male sex), and insufficient attention to cleanliness. The affection is, therefore, met with in persons of the lower class, and in hospital rather than private practice.

Hydatids.—The number of hydatid cysts of the pelvis which have been reported is by no means inconsiderable. F. Villard [1] has collected thirteen of them in women, and the standard surgical writers mention their occasional occurrence. Bryant mentions removing a "basinful" of secondary cysts from one in this position. These swellings are to be recognized by their tense, globular, and elastic feel, and by the fact of their causing no symptoms except those due to pressure, except in cases of suppuration after the death of the entozoon. The cyst has laminated walls lined with a granular layer, and is usually surrounded by a connective-tissue capsule formed from the part in which it is embedded. It may be of any size, and contains a clear, watery, albuminous fluid, in which may be found parts of the entozoon.

Fœtal Inclusions.—In these congenital cysts any fœtal structure may be found. They are not so rare but that several very complete studies have been made of them. Molk [2] gives numerous examples; Verneuil [3] has collected ten cases; and Paul [4] has written exhaustively on the subject, his article being founded on a study of twenty-eight cases. That variety which is located in the sacro-perineal region is the most frequent of all. (Fig. 112.) The sac is composed of three layers, cutaneous, fibrous, and serous. The skin is thinned from distention, is violet or bluish in color from congestion, and an inflammation

[1] "Considérations cliniques sur les Kystes hydatiques du petit Bassin chez la Femme," Annales de Gynécologie, 1878, p. 101.

[2] "Surgery," p. 152, American edition.

[3] Arch. Gén. de Méd., 1855.

[4] "Étude pour servir à l'Histoire des Monstrosités parasitaires de l'Inclusion fœtal situé dans la region sacro-perinéale," Arch. Gén. de Méd., t. xx., 1862.

or a spontaneous rupture may cause perforation of the sac and the escape of the fluid contents. The fibrous layer may be more or less resistant. It is sometimes composed of a simple hypertrophy of connective tissue; at others it is aponeurotic in character. When the sac communicates with the spinal canal, this fibrous layer is a direct extension of the dura mater of the cord. The serous layer is smooth and covered by pavement epithelium, and to one side of it the included fœtus will be found attached. This may also be a continuation of the arachnoid of the cord.

These cysts contain a serous fluid and fœtal contents in the form of an irregular mass, hard and soft in spots. Any and

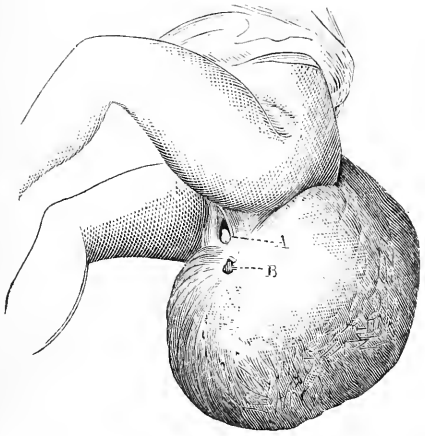

Fig. 112.—Congenital Tumor of Ano-perineal Region.

every part of a fœtus may be discovered in this mass. The tumor is ovoidal in shape, resembling an egg when small, or the scrotum when larger. The size is generally equal to that of the head of the fœtus which bears it, but sometimes equals that of the head at term, and may be larger. The tumor may be biocular; its contents generally give fluctuation and are irreducible, except where there is a communication with the spinal canal. There is no pain unless inflammation has supervened. The diagnosis is generally made by discovering a hard mass of fœtal elements in the midst of a serous cyst. When the cyst communicates with the spinal canal, the differential diagnosis between it and a spina bifida may be impossible.

Such a cyst may cause death by obstructing labor, or by the development of a gangrenous inflammation after birth. As a

rule, operations for their removal have not resulted successfully when undertaken during the first three years of life. One operation practised at a later date has, however, been crowned with success.

Molk divides congenital tumors as follows :

1. Sarcomas and cysto-sarcomas.
2. Encysted tumors.
3. Tumors supposed to arise from degeneration of Luschka's gland.
4. Lipomas and caudal tumors.
5. Fœtal inclusions.
6. Tumors of very complex nature.

He gives a table of 113 cases. Cured by operation, 19. Died from operation, 11.

The treatment must be regulated by the nature of the case, and consists in ligature, ablation, incision, puncture, injections of iodine, or extirpation.

Spina Bifida.—Concerning this variety of cyst little need be said except as regards its diagnosis. It should be borne in mind that a tumor due to a deficiency of the spinal bones may be entirely within the pelvis, in which case it would present great difficulties in diagnosis. Such a case is the following.[1]

Case.—Woman, aged thirty-six; single. The patient stated that ten years before she detected a swelling as large as a goose egg in the right iliac region, her attention having been called to it by shooting pains through the abdomen starting from this point. The size of the tumor increased slowly, had once caused retention of urine, and now caused œdema of the right leg. The patient was cachectic and emaciated.

The abdomen was uniformly enlarged and tympanitic. On making a vaginal examination the cervix uteri could be scarcely reached, situated as it was above the pubes, while a mass was felt behind in the *cul-de-sac*, extending to the right, apparently an ovarian cyst. But from a digital examination in the rectum it was evident that the rectum was pushed forward by a large, soft, fluctuating tumor behind it, which filled up the hollow of the sacrum to within a short distance of the anus.

The patient was placed under ether, and a fine trocar was introduced into the sac, about three inches beyond the anus, by which an ounce or more of its contents were aspirated by Dieulafoy's pump. This fluid was serous in character, perfectly clear and limpid, resembling hysterical urine. It contained no

[1] Emmet : "Prin. and Prac. of Gynæcology," first edition, p. 773.

albumin, and the microscope revealed nothing more than a few oil globules, which had, beyond question, been attached to the instrument before its introduction.

Autopsy, nine and a half hours after death. On opening the abdomen the colon was so much distended as to fill the whole cavity, and reached to a level of the fourth rib, being filled with flatus and fæces. . . . A cyst which contained some three quarts of fluid was found behind and to the right of the rectum, filling completely the cavity of the pelvis, and extending up to a line with the second lumbar vertebra. . . . The rectum was greatly constricted in its upper portion. . . . In attempting to discover the attachments of the cyst in the hollow of the sacrum it was ruptured. The sacrum was removed and a spina bifida found, the three lower bones of the sacrum being deficient on the right side. A funnel-shaped opening communicated directly with the spinal canal, from which projected portions of the cauda equina an inch or more in length. . . . Although the posterior portions of the bones were wanting, no external bulging of the sac could take place posteriorly in consequence of the dense ligamentous structures bridging it over.

The diagnosis of spina bifida can generally be made by the reducibility of the tumor, the signs of pressure on the brain and spinal cord which are produced by pressure on the tumor, the fluctuation at the fontanelles, and the chemical character of the fluid which may be withdrawn for the purpose of diagnosis. The fluid of a spina bifida contains both sugar and urea, as does that of the cerebro-spinal canal; and though both these substances may be found in cysts entirely independent of the cerebro-spinal canal, they will always be found in spina bifida.

There still remains a class of congenital cysts which are neither connected with the spinal canal (spina bifida) nor parasitical (containing fœtal remains). These are often of large size at the time of birth, and may consist of a single cyst or be multilocular. They are generally attached by a pedicle near the tip of the coccyx, though the cyst or cysts may have prolongations in the perineum or the ischio-rectal fossæ. The cyst wall in these cases is fibrous, and when many cysts are present it sends prolongations between them. The integument covering it is thin and generally marked by large veins. The cyst is filled with a yellowish, tenacious, gelatinous fluid, transparent to light as is a hydrocele. It will be seen at once that the great difficulty in diagnosis lies between this form of cyst and a spina bifida, and though the diagnosis may not always be possible, it

will generally turn upon the presence or absence of the signs of communication with the spinal canal when pressure is made upon the tumor.

The treatment of these growths is by extirpation. Injections of iodine, etc., have in them the element of danger from prolonged and extensive suppuration. When extirpation is attempted it should be complete ; and where the cyst is multilocular it should be followed into the perineum and ischio-rectal fossæ, if necessary, in order that no parts of it may remain to undergo subsequent development.[1] These cystic formations, unless of sufficient size to cause death during labor, are not incompatible with life.

[1] Buneau : Bull. de la Soc. Méd. de la Suisse romande (Mollière).

CHAPTER X.

NON-MALIGNANT ULCERATION.

THE many different varieties of non-malignant ulcers which are met with at the anus and within the rectum may best be classified, from the standpoint of etiology, into the following groups: 1. Traumatic. 2. Catarrhal. 3. Tubercular. 4. Scrofulous. 5. Dysenteric. 6. Venereal.

Traumatic Ulcers.—The most frequent traumatism to which the rectum is subject is, perhaps, that arising from surgical interference with diseases of this part. In certain subjects wounds made here by the surgeon may refuse to heal under the best of treatment, and when no reason can be found except in the bad general condition of the patient. This is notably the case after certain operations for fistula; but it will occasionally happen after any of the operations for hæmorrhoids, most frequently after injections of carbolic acid, and, in fact, after almost every sort of operation.

There is no doubt, however, that the constitution of the patient is sometimes made to bear the blame when it more justly belongs to the operator; for wounds which will heal promptly under proper treatment may become very intractable old ulcers under another. For example, a gentleman consulted me about his son, who had been operated upon several weeks before by the family physician for hæmorrhoids, and who was still suffering from a constant discharge of blood and pus. An examination showed that a large hæmorrhoid had been removed from the margin of the anus, and the cut surface, about the size of the thumb nail, had never healed. The patient had felt very little pain the day following the operation, and his physician had encouraged him to get out of bed and go down town. The result was that there had been very little if any attempt at healing; and a wound which would have healed kindly in a few days, had the patient only been kept quiet, required several weeks of careful treatment.

Another gentleman came to me with a fistula which had

resisted all the efforts of two physicians for several months. He had been operated upon, but the wound had never healed. The cut was all of it in plain sight, and it looked perfectly healthy. The man also seemed in good general condition, but there had been two radical errors in the treatment. First, he had never laid up a single day after the operation; and, second, there was a small pocket at the lower end of the wound, which was being tightly stuffed with lint so that it could not close. The latter was incised, the patient put to bed with no dressing whatever to the wound, and in a fortnight was healed. In neither of these cases can the wound be said to have had a fair chance, and such cases are very common.

A perfectly healthy wound may be turned into a sluggish sore by too active attempts to induce it to heal. A fistula which has been cut and is doing well may be kept open indefinitely by stuffing it daily with lint to induce it to heal; and a fissure that would heal in forty-eight hours may be changed into a bad sore by an occasional application of a point of nitrate of silver.

Another not very infrequent cause of ulceration is the presence and passage of hardened fæces containing perhaps undigested substances such as date stones, cherry pits, and seeds of fruits. Some time since a case was brought to me by Dr. Dudley, of Springfield, O., in which, with other troubles, there were several eroded spots in the rectum which could only be accounted for by constipation and the lodgment of hardened fæcal matter in the rectum. They healed promptly after the bowels were induced to act regularly and a few applications of a weak solution of nitrate of silver had been made to them with a brush. We also know that fæcal impaction will cause sloughing of the rectum,[1] and MacCormac has reported an interesting case of fatal perforation from the pressure of scybala.[2]

Some of the worst cases of traumatic ulceration I have ever seen have arisen from the unsurgical treatment of hæmorrhoids. These are always liable to become at first eroded and subsequently ulcerated from extrusion and the passage of hardened fæces; and when to these causes of injury applications of nitric acid or injections of carbolic acid are added, a severe ulceration may be excited which, as in a case now under my care, may result in stricture of the rectum.

A peculiar cause of traumatic ulceration, and one, let it be

[1] See case by Dr. Wright, Lancet, June 6th, 1885; also Pepper's "Practice of Medicine," vol. ii., page 891.

[2] Lancet, July 3d, 1886.

hoped, which will be of short duration, is found in the efforts of patients to treat themselves for supposed rectal disease according to a certain system of quackery now much in vogue, to which I have referred under the head of proctitis. Two other causes of traumatic ulceration, unnatural sexual vice and foreign bodies, will be referred to under their proper headings.

An injury to which women alone are subject, and which is believed by many to go far toward accounting for the supposed greater frequency of ulceration and stricture in them than in men, is bruising of the rectal wall between the head of the fœtus and the sacrum in parturition. Most of the standard authors mention such cases.

The application of nitric acid to prolapse is said to have been followed by disastrous ulceration and stricture ; but such need not be the case, nor is any such use of the acid necessary to effect a cure in any case where its use is indicated at all. Prolapse is not, however, a rare cause of stricture, due to the strangulation and sloughing of the prolapsed portion, and to the subsequent cicatrization.

I have learned by experience to search carefully, in every case of small circumscribed ulceration, for a fistulous track running away from it upon which its existence may depend. It is needless to say that the opening of a blind internal submucous or submuscular fistula will never heal till the fistula has been laid open ; and this is a fact which may be disagreeably impressed upon one's mind after weeks of ineffectual treatment. In the case shown in Fig. 64 I worked many weeks to cure the ulceration before accidentally discovering the second fistula running away from it.

Catarrhal Ulceration.—A catarrhal proctitis, due to any of the causes mentioned as producing that condition, may result in severe and rebellious ulceration. In some of these cases I have had great difficulty in deciding upon the initial cause of the trouble. Men, sometimes physicians, come to me apparently otherwise in perfect health and with no history of traumatism, with more or less extensive erosions and superficial loss of substance of the mucous membrane, complaining of the usual train of symptoms. In women I have learned to look for a causative influence in a malposition of the womb pressing upon the rectum ; but the cause often escapes me in both sexes. Two of the worst cases I have ever seen, one in a child and the other in an adult, were due to the irritation of undiscovered polypi high up in the canal, and to injudicious treatment for the condition with-

out diagnosis. It is hardly necessary to add that both were cured by removing the cause.

The following case shows to what extent catarrhal ulceration may reach :

R., male, age forty-three, married, confirmed opium-eater. The morphine habit has existed six years, and the patient has been decidedly constipated and addicted to the use of cathartics for all of that time. Has not had a movement of the bowels without a cathartic for at least five years. For the first three years his usual dose was from six to eight ounces of castor oil each night. For the last three years has taken three or four improved compound cathartic pills each night, and a half bottle of Hunyadi before breakfast. This produces a passage of about a quart of clear water with shreds of mucus floating in it. As soon as this has been effected the patient gives himself an enema of a quart of tepid water ; and before going to bed this is again administered. The patient complained of occasional passages of blood and of great pain along the whole intestinal tract, but particularly in the sigmoid flexure and along the greater part of the larger bowel. This case is related more as a curiosity than otherwise, as the patient was not long enough under my care to see what could be done. Even in the course of a few weeks, however, so much was gained by an intelligent course of treatment as to hold out good promise of ultimate cure.

I may remark incidentally that a congested state of the lower bowel, often associated with fissures of the anus, is a very common accompaniment of the constipation due to the opium habit. Several such cases have recently been sent to me from a neighboring retreat for the treatment of this condition, and in all constipation was a marked result of the habit.

For some years back the quacks who are ever active in diseases of the rectum have been devoting their special attention to ulceration of the sinuses of Morgagni, which they cure by slitting them up. For my own part I do not often see any of these little pouches which are sufficiently developed to admit of being slit open, to say nothing of concealing an ulcerated surface. The following case by Vance [1] is worthy of credit, but the condition must be a very rare one :

A lady, aged eighteen, had suffered for more than a year from all the symptoms of fissure, had been frequently examined to no purpose, and was reduced to a very miserable state. On

[1] Medical and Surgical Reporter, August 14th, 1880.

examination the integumentary folds were congested, thickened, and œdematous, doubtless as a result of constant scratching, but there was no trace of anything like a fissure. The lining membrane was searched with the utmost care, but no lesion of any sort was revealed except slight hypertrophy of the sphincter. A second painstaking review of every part of the rectum gave the same result, and the author was about to abandon the hope of finding any local lesion when as a matter of form—for there was no evidence of disease about them—he determined to pass a probe into each of the pouches. The probe could not be forced into the first one, and with the second he fared no better, but with the third, after an ineffectual attempt, the probe passed into the sacculus.

No sooner had the probe entered, however, than the patient screamed with pain, and there was a spasmodic retraction of the levator ani and sphincter muscles, and the part was forcibly withdrawn from view. The site of the sacculus felt as if a buckshot had been embedded in the tissues, so hard and swollen was the part. A small probe-pointed tenotome was carefully passed along the canal, and as soon as the sensitive point was touched the handle was brought down and the edge of the knife made to sever the inner wall of the sacculus and expose the diseased point. This done, the cause of the suffering was revealed. On the left side of the anus, and at a point where there had been no unusual sensibility, an indurated ulcer had formed within one of the little pouches. When the sacculus was opened and the ulcer exposed, it seemed very much like an ordinary fissure of the anus, but before cutting it open there was no evidence whatever, save the symptoms the patient complained of, to indicate the existence of such a lesion.

An eruption of herpes around the anus, similar to what is seen on the lips, may result, after rupture of the primary vesicles, in numerous small superficial ulcers of a reddish color and secreting a little pus. These may coalesce at their edges and form a serpiginous sore. They are apt to be accompanied by similar eruptions on other parts of the body, and must be carefully distinguished both from mucous patches and soft chancres. The ulcerations which result from acute and chronic eczema and from pruritus present no special characteristics. They are generally due to the injury inflicted by the nails of the sufferer.

Irritable Ulcer, or Fissure.—An injury due to any of the causes already mentioned may, in certain persons, and when located at the verge of the anus, assume the characteristics of

an affection which has been elevated into a separate class, and is known as fissure, or irritable ulcer. The irritable ulcer differs in no respect from other simple ulcers in the same locality, except in the fact of its irritability. There is nothing peculiar in the ulcer itself. It may be due to a slight rent in the mucous membrane from hard fæces; to a congenital narrowness of the anal orifice and a naturally over-powerful sphincter;[1] to the irritation of a leucorrhœal or gonorrhœal discharge in women; to an herpetic vesicle, or to the venereal sore which it so strongly resembles—the soft chancre. Any sore which is fairly in the grasp of the external sphincter is apt to become an irritable or painful one; and a fissure may be painless at one time and painful at another in the same person, or painless in one person and painful in another.

For this reason Gosselin[2] has divided these ulcers into two distinct varieties, the tolerant and intolerant—a classification which Mollière[3] still further improves by suggesting the words tolerable and intolerable. An ulcer associated with contracture, spasm, irritability, and sometimes with actual hypertrophy of the sphincter, is what is known as an irritable one; and without this condition of the muscle it will not properly come under this classification, but a fissure may exist without causing any of these symptoms.

This contracture of the muscle may be temporary or permanent, and is due to the irritation of the sensitive nerve filaments on the surface of the ulcer by the passage of fæces, and to the reflex action excited thereby; and to many slighter causes, such as laughing, coughing, sneezing, or position. It may even come on spontaneously in persons of a highly nervous organization, or with such slight provocation as to appear to be spontaneous.

There are two well-known theories regarding the causation of this little sore. According to Boyer,[4] the foundation of the trouble is a spasm of the sphincter muscle, and the fissure is merely a secondary lesion due to the passage of fæces through the spasmodically contracted anus.[5] Trousseau, on the other hand, reverses the relation, and very properly, holding that the fissure exists first, and that the spasm of the sphincter and the resulting pain are reflex, being specially apt to occur in persons

[1] Mollière: "Sarremone," Thèse de Strasbourg, 1861, No. 555, p. 134.
[2] "Dict. de Méd. et de Chirurg. Prat.," art. "Anus."
[3] Op. cit., p. 149.
[4] "Traité des Maladies chirurg.," t. x., p. 105.
[5] "Clin. Med.," t. iii., art. "Fissure."

of neuralgic tendency, and being in many cases merely the local manifestations of a general nervous state.

These ulcers are generally situated at the posterior commissure, but may be found anywhere on the anal circumference. They are generally single, but there may be two or three, more especially when of venereal origin. They are more common in women than in men, because constipation is more common in the former and because the skin is finer. They are confined to no age and are by no means relatively rare in infants.[1] They are generally oval in shape, with their long axis vertical, and involve both skin and mucous membrane, being situated just at the junction of the two. In some cases they have the appearance of a simple erosion, in others of an old ulcer with grayish base and indurated edges which has involved the whole thickness of the mucous membrane and extended fairly down to the muscle beneath. In the majority of cases they are not attended by suppuration.

From what has been said of the etiology of these simple ulcers it is plain that they must present many variations in appearance ; yet the diagnosis of each from the other, and of the whole class from those which are to follow, will not generally be found difficult if proper attention is given to the history, the appearance of the lesion, and its course. The disease is generally of a healthy type, and tends to self-limitation and spontaneous cure rather than to increase. The ulcerative action is generally superficial, and tends to extend on the surface rather than in depth. It is generally surrounded by the signs of reparative action, and with proper care will undergo cicatrization, which, when extensive, will result in stricture.

When, however, these ulcers are improperly treated, or when there exists such a constitutional state that healthy reparative action cannot be excited by treatment, any of these sores may assume a condition of chronicity and sluggishness with slow increase in size, gradually encroaching more and more upon healthy tissue till a large part of the anus and lower rectum is involved.

[1] Kjellberg (Nordiskt Med. Arkiv, bd. viii., heft 4) has called attention to the comparative frequency with which fissure is met with in children, which he believes to be much greater than is generally supposed. In 9,098 children brought to the Polyklinik of Stockholm, it was found 128 times ; 60 of the cases were boys and 68 girls. The majority were under one year of age, and 73 under four months. The symptoms resemble those in the adult, but are less severe, and the treatment is the same, care being taken to remove anything which may act as a cause of the trouble, such as constipation, worms, rectal catarrh, etc.

Such chronic ulceration of simple nature, and neither tubercular, cancerous, syphilitic, dysenteric, nor lupoid, will rarely be found outside of the lower walks of life, or in people surrounded by ordinary hygienic conditions, unless directly due to long-continued irritation, and generally to irritation in a scrofulous or otherwise cachectic person. The often-repeated irritation by drastic purgatives of a rectum partly filled with hardened fæces, or the frequent passage of bougies, is sufficient to produce it when the constitutional state is favorable. Such ulceration may be very extensive, fully as great as in some of the varieties yet to be described, and may only be diagnosticated from them by careful study. They may also be practically incurable.

Tubercular Ulcers.—There are two varieties of ulceration met with in persons of the tubercular diathesis; one due to the actual deposit and softening of tubercle, the other a simple ulceration containing no tubercular deposit, but modified in its course by the patient's general condition of malnutrition. The former may properly be called tubercular ulceration, and the latter is better known as the ulceration of the tuberculous. The former is not so rare as was formerly supposed. It may occur in the rectal pouch, or indeed anywhere along the course of the alimentary canal, and it is sometimes seen at the verge of the anus, where it may exist before any general manifestation of tuberculosis.

The characters by which such an ulcer may be recognized are its pale-red surface covered with a small quantity of serum, but devoid of healthy pus and appearing as if varnished; the absence of all surrounding inflammation and of the granulations which exist in a healthy sore; its tendency to spread in depth rather than on the surface; the absence of any marked pain; the regular outline ending abruptly in healthy skin; and above all its chronicity and the utter failure of all remedies to affect its steady course. The diagnosis may be confirmed by the microscope or by inoculation of the eye of a rabbit, and the disease is analogous to tuberculosis of the larynx, which, however, has been studied much more thoroughly. (Fig. 113.)

These ulcerations begin with swelling of the follicles from the deposit in and around them of tubercle. The tubercles caseate and break down, forming funnel-shaped ulcers. New tubercles are constantly formed in the bases and edges of these ulcers, and these in turn break down and increase the size of the ulcer, while several ulcers may finally coalesce. The process is sometimes limited in depth to the muscular layer and at

others only by the peritoneum. It may be a primary affection, but is usually secondary to tubercular deposit in the lungs.

Such an ulcer may be the cause of stricture. It is exceedingly difficult to induce them to take on a healthy reparative action; and if cicatrization begins, the process is generally incomplete and the cicatrix easily breaks down. Sands, however, relates a case of stricture in a boy aged eighteen, due to tubercular deposit, both in the rectum and peritoneum, for which he performed colotomy, the deposit being on the anterior

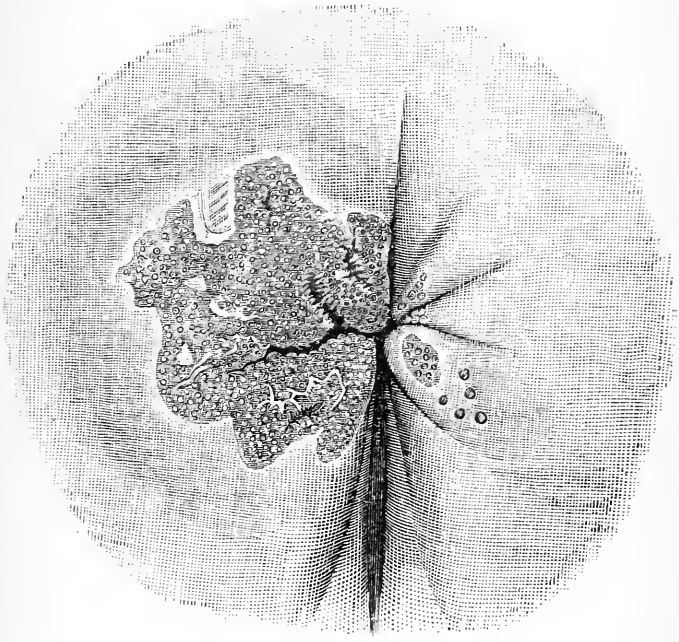

Fig. 113.—Tubercular Ulceration. (Esmarch.)

wall at the level of the pubic symphysis, and the rectum being so nearly occluded as not to allow of the passage either of an instrument or an injection. On autopsy a portion of the small intestine seven feet long was also found to be so narrowed as to admit of the passage only of a full-sized bougie, but the narrowing in both cases seems to have been due rather to the encroachment of the tubercular mass than to cicatrization and subsequent contraction.

A tubercular ulcer starting in the wall of the rectum may end in perforation and fistula (fistula with large internal open-

ing), and, as a matter of course, the usual operation in such a case would be followed only by disappointment. Such an ulcer has also been known to cause sudden death from hæmorrhage in a child, aged four years, the subject of acute general tuberculosis.[1]

The other variety of so-called tubercular ulcer is a simple sore in a phthisical patient, modified in its course and characteristics by the general condition. It may result from any of the causes already mentioned, and any of the varieties already described may, under the proper conditions, assume its characteristics. It may occur either within the rectum or at the anus, and may vary in size from a mere spot a quarter of an inch in diameter to a sore covering the whole lower part of the rectum. It may extend in depth as well as on the surface, may perforate and cause abscess and fistula, or be attended by thickening of the wall without decrease in calibre. It is often accompanied by numerous polypoid growths ; it is generally painful, and the discharge is purulent. It neither extends rapidly nor heals easily, and yet it is surrounded by a healthy reparative action, and, unlike the true tubercular sore, it may be induced to heal, and is one of the causes of grave stricture. The process is essentially a chronic one, and several of the cases of "chronic ulceration of the rectum" reported by Curling come properly under this category. It may easily be distinguished from true tubercle, but may readily be confounded with some of the varieties which are to follow.

Scrofula.—Allied to the class of ulcers last named are those in which the scrofulous taint manifests itself, as it may do either in follicular ulcers of the rectum and large intestine, in lupus or *esthiomène*, and in rodent ulcer. The last two affect primarily the anus and perineum.

Follicular ulceration is due to a chronic inflammation and fatty degeneration of the follicles of the rectum. These, which, when first affected, appear as small caseous nodules, break and leave small, deeply excavated ulcers, which, being multiple, may coalesce and leave larger ones of the chronic variety, capable of subsequent healing with the formation of cicatricial tissue.

They may perforate the bowel or form fistulæ of the blind internal variety when low down, or cause peritonitis when higher up. They may be only one of many manifestations of the scro-

[1] Ashby, "Trans. Manchester Med. Soc.," Brit. Med. Journ., July 31st, 1880.

fulous tendency in the same patient, and they frequently co-exist with pulmonary disease.

Under the title *esthiomène* (lupus exedens of the ano-vulvar region) a number of phagedenic ulcerations, complicated with more or less hypertrophy of the nature of elephantiasis, have been described by different authors.

I am indebted to my friend Dr. R. W. Taylor, of New York, for a clinical lecture on this affection in his wards at Charity Hospital (since published [1]), which has made me a firm convert to his original ideas. After years of clinical observation he has come to the conclusion that there is no such distinct disease as *esthiomène*, and that the term should be dropped from medical literature. He believes, and I agree with him, that any ulcerative process around the female genitals, syphilitic or otherwise, if neglected, as it is apt to be in the lower walks of life, may end in the great loss of tissue and hypertrophy of the surrounding parts which is generally described under this name. His conclusions, more fully quoted, are :

1. That a large and perhaps the greater number of chronic, deforming, vulvar affections are due to simple hyperplasia of the tissues induced by irritating causes, inflammation, and traumatism.

2. That chronic chancroid is a cause in a certain proportion of cases.

3. That many cases are due to essential and specific syphilitic infiltrations.

4. That other cases are caused by the hard œdema which often complicates and surrounds the initial sclerosis and perhaps gummatous infiltration.

5. That many cases are due to simple hyperplasia in old syphilitic subjects who suffer from chronic ulcerations of the vulva long after all specific lesions have departed.

6. That some cases also in old syphilitics are due to simple hyperplasia without the existence of any concomitant ulcerative or infiltrative process, and seem to be caused by conditions which usually in healthy persons only result in vulvar inflammation.

The ulcer is irregular in outline, with a granular base of a violet-red color, and there is a slight sanious discharge. The edges are but little elevated and are not undermined, and there is more or less hypertrophy of the surrounding tissue, which, in some cases, is exceedingly well marked. The ulcer may cica-

[1] N. Y. Med. Jour., Jan. 4th, 1890.

trize in part, the cicatrix being thin and white, at the same time that the ulcerative process is extending in the opposite direction. At a little distance from the ulcer there is often a pathognomonic appearance of slight, reddish, hard nodules of tubercular lupus, separated from the primary sore by healthy skin. With this amount of disease the constitutional disturbance is often not sufficient to confine the patient in the house.

The diagnosis is not generally difficult, though the disease may be confounded with cancer, phagedenic chancroid, and with elephantiasis with secondary ulceration. It is best distinguished from cancer by the cicatricial bands which it leaves behind in its ineffectual attempts at healing, and from chancroid by the surrounding tubercles, which in lupus develop in the thickness of the derma and ulcerate secondarily; while the ulcers which sometimes surround a chancroid are ulcerous from the first, being due to secondary inoculation. Van Buren advances the theory that most of these ulcerations are due to the grafting of the syphilitic poison upon the scrofulous diathesis in women of improper lives. The duration of the disease is indefinite, and it seldom leads to fatal results. It is best treated by destructive cauterization and raclage.[1]

The disease is well shown in Fig. 114, from Taylor.

I have, by the kindness of Dr. Lee, of Newark, N. J., recently seen a very unusual case of this disease, inasmuch as the patient was only fourteen years old and had been suffering since the age of nine. The usual manifestations were perfectly characteristic, the labia were enormously hypertrophied, and the destruction of the rectum was so great as to lead me to advise a colotomy. In this case there was a good history of congenital syphilis.

Rodent Ulcer is very closely allied to epithelioma, and may, in fact, be considered one of its varieties; but it is distinguished from it clinically by the fact that it does not infiltrate surrounding tissue, does not involve the lymphatics, and does not become generalized. It is the same disease met with upon the face, and is exceedingly rare at the anus, being seen only twice in four thousand consecutive cases at St. Mark's Hospital.

According to the classical description of Allingham, it is found by preference at the verge of the anus, and extending from this point upward into the rectum. It is irregular in shape, and its edges end abruptly in healthy tissue. Its sur-

[1] See also Huguier: "Mém. Acad. de Méd.," 1849; Harday: "Scrofule et Scrofuides," p. 80; Péan et Malassez, op. cit.

face is red and dry ; it destroys superficially, attacking mucous membrane rather than skin, and undergoes rapid but only partial cicatrization under proper local and constitutional treatment. It never entirely heals, and is not to be included among the causes of stricture. It is at first generally mistaken for a

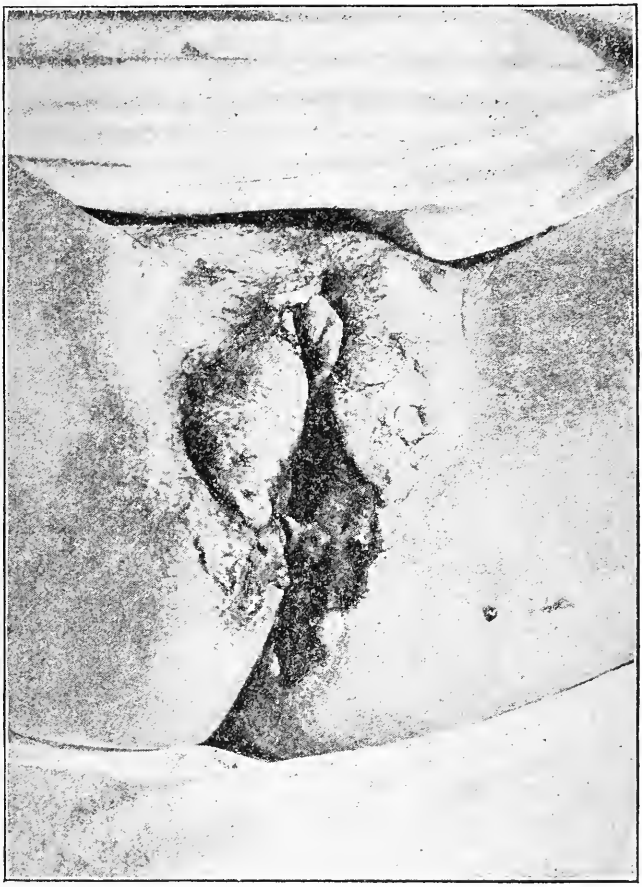

Fig. 114.—Esthiomène. (Taylor.)

late syphilitic manifestation, but is distinguishable from it by the powerlessness of all treatment to prevent its steady progress. It is one of the most painful of all the ulcerative affections of this part, and ends fatally unless some other disease cuts short the history. It is best treated by complete excision, and this, in one case of Allingham's, secured immunity for a

period of four years during which the patient was under observation.

Dysentery.—In dysenteric ulceration the diseased portion of the lower bowel becomes infiltrated with fibrinous exudation, and, as a result of the compression which this exercises, is necrosed and sloughs. When the slough is cast off, there results a loss of substance, and if this is superficial the membrane may regain its former state; but if deep, the usual callous cicatrix is produced in its place, and stricture is the result.

The ulcers resulting from this process vary much in size, location, and appearance. They may be minute circles, but are generally large, and, though their favorite site is the rectum or sigmoid flexure, they may be found anywhere in the large intestine. They may extend so as to coalesce and leave only islands of mucous membrane between the extensive patches. The process usually involves only the mucous coat, but may extend in breadth and result in perforation and its attendant evils. The coats of the bowel may become sinuous abscesses, so that, on dividing the prominent portion of mucous membrane between two ulcers, several drachms of pus may escape (Habershon). Although all the symptoms of dysentery may result from ulceration due to other causes, as in Annandale's case,[1] there is no doubt that in this country the disease is one of the causes of chronic ulceration and stricture, and Habershon concludes that the disease is more common in our climate than is generally supposed.

In the "Medical and Surgical History of the War of the Rebellion,"[2] Dr. Woodward remarks that stricture resulting from dysenteric ulceration seems to have been much rarer than might have been supposed, and that no case has been reported at the Surgeon-General's office, either during the war or since; that the Army Medical Museum does not contain a single specimen; nor has he found in the American medical journals any case substantiated by *post-mortem* examination in which this condition is reported to have followed a flux contracted during the Civil War. In the *Amer. Journal of the Medical Sciences* for April, 1881, I published a case which I then believed came under that category, and the subsequent history of which has only the more convinced me of the correctness of the diagnosis.

The venereal ulcers will be treated of in the next chapter.

Symptoms.—The symptoms of what is known as the irritable

[1] Brit. Med. Journ., page 681, 1872.

[2] Part ii., vol. i., Med. Hist.

ulcer or fissure are so well marked as to render its diagnosis in most cases easy. The chief is the peculiar pain, which may be constant, but is always increased by defecation. The act of defecation itself may not be notably painful, but after the act, sometimes almost immediately, sometimes after a short interval, the characteristic suffering begins and may last in mild cases an hour or two, or in severe ones nearly all of the twenty-four hours. The pain is described by the sufferers as dull gnawing and aching rather than lancinating, and with it there will often be associated neuralgic pain in the loins and down the thighs.

As a result of this suffering, at first periodic and later constant, a very miserable general condition is often developed. The sufferer soon learns to dread the act of defecation and to postpone it as long as possible, till a state of chronic constipation is produced which is overcome at long intervals by purgatives; and in this way the whole digestive apparatus is thrown out of order. In women also there is apt to be reflex irritation of the bladder, with tenesmus; and in men there may be spasmodic stricture of the urethra. In women, also, it is not uncommon to find uterine trouble combined with that at the anus. It is sometimes a matter of amazement to the physician to see how long a woman will suffer from a simple sore of this kind, and to what a condition of invalidism she will allow herself to be reduced before she will seek for aid. The struggle between feminine modesty and the desire for relief may last for many years before common sense finally gains the victory.

It will sometimes be found that as great suffering may be caused by a simple erosion at the anus as by more extensive and deeper ulceration, and indeed the amount of pain is not at all indicative of the depth or extent of the sore. The element upon which the pain directly depends is probably the exposure of nerve filaments. Moreover, the susceptibility to pain varies greatly in different people, and a woman of high nervous organization may be completely invalided by a sore which would not prevent a laboring man from attending to his daily avocations.

Ulceration within the rectum is also attended by a certain train of symptoms which render its existence extremely probable, and which in themselves are sufficient to denote the presence of an ulcerative process, though throwing little light upon its nature. These have been so well described by Allingham that we cannot do better than give them in his own words:

"In the majority of these cases the earliest symptom is

morning diarrhœa, and that of a peculiar character, in my opinion quite indicative of the disease [ulceration], and can only be confounded with cancer. The patient will tell you that the instant he gets out of bed he feels a most urgent desire to go to stool; he does so, but the result is not satisfactory. What he passes is generally wind, a little loose motion, and some discharge resembling 'coffee-grounds' both in color and consistence; occasionally the discharge is like the 'white of an unboiled egg' or 'a jelly-fish,' more rarely there is matter. The patient in all probability has tenesmus and does not feel relieved; there is something of a burning and uncomfortable sensation, but not actual pain. Before he is dressed very likely he has again to seek the closet; this time he passes more motion, often lumpy, and occasionally smeared with blood. It also may happen that after breakfast, taking hot tea or coffee, the bowels will again act; after this he feels all right, and goes about his business for the rest of the day, only perhaps being occasionally reminded by a disagreeable sensation that he has something wrong with his bowel. . . . After this condition has lasted for some months, more or less, as influenced by the seat of the ulceration and the rapidity of its extension, the patient begins to have more burning pain after an evacuation; there is also greater straining and an increase in the quantity of discharge from the bowel; there is now not so much jelly-like matter, but more pus—more of the coffee-ground discharge and blood. The pain suffered is not very acute, but very wearying, described as like a dull toothache, and it is induced now by much standing about or walking. At this stage of the complaint the diarrhœa comes on in the evening as well as the morning, and the patient's health begins to give way, only triflingly so perhaps, but he is dyspeptic, loses his appetite, and has pain in the rectum during the night which disturbs his rest; he also has wandering and apparently anomalous pains in the back, hips, down the legs, and sometimes in the penis."

We need scarcely call attention to the extreme gravity of this condition, or to the certainty with which, if untreated, and sometimes, indeed, in spite of the best treatment, it will end either fatally, or in stricture which will require the gravest surgical procedures for its relief. The picture is unfortunately a familiar one to every general practitioner, and a case of severe or extensive ulceration of the rectum is perhaps one which calls for as much skill in treatment and yields as poor results as anything in the range of surgery.

Diagnosis.—The diagnosis of the existence of ulceration is generally easy with sufficient care. A small ulcer within the grasp of the external sphincter, or partially concealed within one of the sacculi, may easily escape a cursory examination; but no ulceration within four inches of the anus is beyond the reach of actual touch and vision, and none need, therefore, escape detection when the examination is properly conducted. In many cases the diagnosis is plain, the sphincter will be found destroyed, and the rectum and vagina will present one common cavity of foul appearance, from which issues a fœtid, purulent discharge. In other cases, by a careful and gentle pulling apart of the lips of the anus and a gentle straining down on the part of the patient, a small ulcer within the grasp of the sphincter, or at least its lower edge, will be brought into view without the use of the speculum or ether. In others a digital examination will reveal an eroded, painful spot within the rectum, and when the finger is withdrawn it will be found stained with blood. In all such cases the diagnosis is easy; in others there is but one way to make a diagnosis, and the secret of success will be found in the two words—ether and the speculum. This is the way, I am sorry to say, which is least often followed by the general practitioner. It is much easier to give a lady a diarrhœa mixture and trust in Providence for a cure than to gain her consent to take ether and be thoroughly examined, and for this reason many a case of curable disease has been allowed to reach an incurable stage before its existence has been certainly determined. The existence of a chronic diarrhœa, or of a discharge of any kind from the rectum, is always a good and sufficient reason for a thorough physical examination, and with ether, a dilated sphincter, and a good speculum no one need be in doubt as to the existence of ulceration in the lower part of the rectum.

The existence of ulceration being decided, its nature remains to be determined. We have already, in speaking of the different varieties, given some of the chief points in the differential diagnosis, and to these we must again refer the reader. In every case the history must be taken into account, as well as the appearance of the lesion. Of the many varieties we have mentioned, some may almost certainly be excluded from their great rarity. Amongst these are the true chancre, the tubercular deposit, and rodent ulcer. In the majority of cases, after excluding syphilis, the ulcer will be of the simple variety first described, modified more or less by the general condition of the patient, or it will be malignant.

Treatment.—In speaking of the treatment of ulceration of the rectum and anus, we will first deal with the simplest form, the irritable ulcer, and then with the more severe, postponing the question of stricture, which is the most frequent result of severe ulceration, to a separate chapter.

The treatment of fissures at the anus should in the first place be preventive in those persons in whom the skin of the part is sensitive and liable to cracks and small sores; and for such there is nothing better than the daily washing of the part with cold water and a soft sponge, and the avoidance of anything which may tend to irritate it, such as the use of printed or rough paper after defecation.

When fissures really exist, they may often be cured by a nightly application of Goulard's liniment on a pledget of lint, or by gently touching the surface with a solution of nitrate of silver to coat the sore (gr. v. or x.–℥ i.).

I have been surprised, in my own practice, at the remarkable results which can be obtained in simple fissures with applications of weak solutions of nitrate of silver, and I have the notes of many cures by this means, some of them by a single application, combined with a light laxative to insure easy passages.

There are many analogies between fissure of the anus and fissure of the lip, and early in my practice it occurred to me that tearing the mouth wide open would be rather severe practice for a cracked lip, and doing the same thing at the anus was unnecessarily severe for a fissure. The idea of curing these troublesome sores by simpler means was not original, but was derived from Hilton's classical work on "Rest and Pain."

The following cases are taken in their order from my case book:

Dr. H. Has been troubled with fissure for some time. Has arranged his affairs so as to lie by for a few days, and desires to have the sphincter stretched to-morrow. On examination a small excoriation of the size of a split pea was found anteriorly and touched with a ten-grain solution of nitrate of silver, and he was told to come again next day. He came next day, but "was busy and couldn't wait." He was seen in the afternoon by chance, and pronounced himself *cured*, and said he would come on the following day if he had any trouble, but he did not come. Has never had any trouble since.

Male, aged fifty-two, a chronic sufferer from rectal trouble. On examination a small cutaneous, pendulous tag was found

hanging from the anus. On unfolding this a large and exquisitely painful fissure was found contained within it, which extended well up within the rectum. The part was so sensitive that it could hardly be touched with the brush, and the man's sufferings in defecation were frightful. He was touched with a ten-grain solution of nitrate of silver, an injection was given, and he had an evacuation, the first in several days, but, thanks to the injection, much easier than he had expected, and attended with rather less blood than usual. A laxative was given that night, and the sufferer had an evacuation after an enema in my office the next morning, which he pronounced the only comfortable one he had had for weeks, and the fissure was again painted with a ten-grain solution of nitrate of silver. The laxative was continued regularly, the enema was given every morning before stool, and the stool was followed each time by an application of nitrate of silver. On the seventh day the patient pronounced himself well, and voluntarily ceased treatment.

The patient, a man aged forty-one, has had pruritus seven or eight years. For this he has had general and local treatment of every variety. The sphincter has twice been stretched for fissure. On examination some thickening of the skin was found, with several small cracks, none of them within the grasp of the sphincter and none causing any great pain, but keeping up a constant irritation and a desire to rub the part. These were easily cured by applications of nitrate of silver, and the patient was much relieved. The treatment for pruritus lasted about three months before a cure was effected, and during that time the cracks appeared two or three times, with the usual increase in irritation and itching. Each time they were induced to heal by a few applications of the brush. The patient has learned to recognize the condition, and once every few months comes in with the information that he has another fissure, which came while at stool that morning. A few applications always induce rapid healing.

Dr. M., suffering from advanced phthisis and fissures, which bleed and cause much pain at stool. On examination two large fissures were found—one in front, the other behind. In this case weak solutions of nitrate of silver, and applications of bismuth, calomel, and iodoform in powder, each failed, after a fair trial, to effect a cure. The patient was badly nourished, and the skin around the anus had very little healthy tonicity. An ordinary pulling apart of the anal folds, to get at the fissure already existing, would sometimes cause a new one to form.

Cicatrization was finally secured by the daily application of a few shreds of very fine lint to the abrasions, and for a time the patient was in comfort. The trouble reappeared, however, after a time, and the treatment by lint was resumed, but in the midst of it the patient disappeared, and, I presume, went to another climate for the pulmonary trouble.

This patient had unfortunately been addicted to the opium habit, and the resulting constipation had caused a remarkable condition of the anal skin and mucous membrane. The passages for some time had been very large and hard, and attended with great pain and some blood. On examination, at the junction of the skin and mucous membrane as many as twenty abraded points were distinctly visible, each of about the size of a pin's head. The parts were tender and bruised, and bled freely when touched. Daily applications of nitrate of silver were made for a week, and the patient was discharged cured.

Dr. ——. Has had fissure for two years, with great pain and much resulting constitutional disturbance. The ulcer—and in this case it was a distinct ulcer with grayish base—was situated posteriorly. For a few days the treatment by local applications was followed with decided improvement, but time failed us. The patient had his passage engaged for Europe, and a few days before he sailed I was obliged to stretch the sphincter.

Mrs. ——. Had had fissure for several days, with the usual symptoms. The crack was well marked and located posteriorly. A single application of nitrate of silver effected a permanent cure.

Miss ——, aged forty-five. Has distinct fissure posteriorly, which has existed for some months. Cured by three applications.

Miss ——. Has had fissure for some months. Has previously been operated upon for hæmorrhoids. Fissure well marked and posterior. Cured by six applications of nitrate of silver.

Mrs. ——. Sent by Dr. Fox. Has had fissure about three weeks, with the usual symptoms. It was greatly relieved by a single application, and practically cured by two, though the treatment was continued for a few days longer to induce sound healing.

Mr. D. Very painful fissure at base of an old external hæmorrhoid. Treated for one month by applications of nitrate of silver, and discharged cured.

R. S. Sent by Dr. Janeway; was operated on three months before for hæmorrhoids; now has pain and blood at stool, and has

recently been treated by applications of nitrate of silver in solid stick. On examination a fissure was found posteriorly, which looked as though the wounds of the operation had never quite healed. The usual treatment was begun, and continued till the patient was quite well. Very soon after this point was attained he neglected himself, allowed himself to become constipated, and in a week returned with the same trouble. The same treatment was repeated, and in a few days the patient was again cured.

Dr. A. Fissure of a few days' standing. Cured with three applications of nitrate of silver.

Mr. —— one week ago began to suffer from pain and bleeding at stool. Fissure greatly relieved by a single application, and he was discharged cured in one week.

Dr. R. Has been troubled with pain occasionally after stool during past eighteen months; now has severe pain and some bleeding. Cutaneous tag posteriorly, and fissure at the base of it. He was treated in the usual way, and in two weeks was cured. In a month he returned, complaining again of pain, and the cutaneous tag was found acutely inflamed. This was cut off, and the patient has since remained well.

The patient had three years before been operated upon by Allingham's method for hæmorrhoids, and has never thought she was quite well since. On examination a superficial fissure was found anteriorly, with the usual symptoms, and an application of nitrate of silver was made. On the following day she was much relieved, and a second application was made. On the third day she expresses herself as feeling "as though she never had had any trouble," and the disease is found cured.

Here, then, are sixteen cases of fissure, not selected, but taken in their order from my case book. In one only have I operated, and in that one simply from lack of time to carry out the treatment I shall describe. In only one has the patient disappeared without a satisfactory cure, and his case was complicated with advanced pulmonary disease, and the result is not known. In some of the cases a cure was obtained at a single visit. This is certainly a very satisfactory showing, and it can be obtained by the following very simple rules:

1. Begin the treatment by ordering a laxative every night, so that at least two passages can be secured daily.

2. If defecation is very painful, give an enema in the morning and secure an evacuation before making any application to the fissure.

3. Touch the fissure thoroughly each day with a solution of nitrate of silver, varying from five to fifteen grains to the ounce. Do this gently but thoroughly with a soft camel's-hair brush.

4. If this fails, try the insufflation of calomel, bismuth, or iodoform, in dry powder; and should these not succeed, lay a piece of very soft and fine lint in the sore and change it daily.

If the treatment is followed with delicacy and skill, I am convinced that it will seldom fail.

The occasional light application of the solid stick of nitrate of silver will sometimes effect a cure, but cauterization should be used with great caution. An ointment of the oxide of mercury (℥ ss.—℈ i.) will sometimes prove effectual, and I have myself been very well satisfied with the results obtained by the occasional passage of a simple hard bougie, well oiled, and allowed to remain a few minutes within the anus. With these means at my disposal, I now seldom find a fissure which cannot be cured by milder means than stretching the sphincter.

In children the fact that fissures and erosions may be due to the scratching caused by the irritation of pin-worms must always be borne in mind.

In fissures complicated with polypi, the polypus must always be removed at the time of the operation; and in women suffering from the union of uterine and vesical trouble with painful ulcer, the uterus must be treated as well as the ulcer, or the operation on the latter will be apt to fail.

In cases where the treatment by local applications has failed, the operation of drawing a sharp knife through the ulcer and muscular fibres directly beneath it is the one to which I give preference, preferring it to stretching because it can be done in the most satisfactory way with cocaine, while stretching cannot. The cocaine (five minims of a four-per-cent solution) should be injected beneath the ulcer. It is customary to use a fenestrated speculum in such an operation, but it may easily be dispensed with when a straight, blunt-pointed knife is used. The knife should be very sharp, and the operation must be skilfully done, but when properly done it is usually successful.

It is not necessary to cut entirely through the sphincter, and yet those fibres of it which form the base of the ulcer should be fairly divided, for it is by putting an end to the contractions of these fibres that the operation works its cure. The operation should always be extensive enough to produce a certain amount of relaxation of the muscle.

The most frequent cause of failure in any of the procedures

commonly employed for the cure of fissure is the presence of a small polypus or an external hæmorrhoidal tag in connection with the sore. These should always be searched for with great care, hence with a speculum, and should always be removed when found. Otherwise neither stretching nor division of the sphincter will be of much avail.

The treatment of ulceration within the rectum is a much more difficult matter than the treatment of that at the anus, and yet in principle they are the same. In both we give the ulcer rest, and try to assist nature in her own methods by avoiding anything which shall interfere with the process of repair. The treatment of ulcer of the rectum may therefore be summed up in two words, rest in bed and fluid diet. I do not think I exaggerate when I say that these alone will cure most cases that are curable, and that without them no treatment is likely to be of much avail.

The rest in bed must be absolute, and is not such rest as is usually considered by ladies to be compatible with a morning bath, a rather elaborate toilet while standing before the mirror and walking round the room, and a final sitting down to comparative quiet in an easy chair or on a lounge for a part of the day till the reverse of the performance is repeated. Rest in these cases means rest in bed for weeks at a time, and the line should be drawn on exercise at just what is necessary for the use of the commode which is brought into the room and placed by the patient's bed when necessary. After considerable experience I have found it easier to begin right in these cases than to waste a couple of months while the patient is half-resting, and then have to come to it in the end ; and have again and again been surprised to see how quickly reparative action will begin in the one case, and how long it may be delayed in the other. An hour's walking and standing around the sick-room will undo more than the other twenty-three can gain.

This point being carried to the surgeon's satisfaction, the milk diet need not be so absolute, but may be varied with soups and easily digested solids, as bread and crackers, care being taken to secure soft and unirritating passages. With such diet as this it will sometimes happen that a movement of the bowels every two or three days will be all that nature requires, and as long as such a condition causes no uneasiness I am not accustomed to interfere with it by laxatives.

In cases where it is well borne, cod-liver oil may be adminis-

tered both as food and laxative, often with excellent effect upon the general condition and the local trouble.

In the way of local applications suppositories may answer a good purpose. The menstruum should be of some substance which may be easily dissolved at the temperature of the body; and in the way of drugs I have had more satisfaction with bismuth and iodoform than with anything else. The practice of introducing local remedies in this form has many advantages over that of applying them by means of a speculum, because a speculum examination of an ulcerated rectum, repeated two or three times a week, is apt to do more harm by its mere introduction than the remedies will do good. The utmost gentleness must be used in all cases, and the greatest care is necessary to keep from irritating the part. I have also found it well to mix about the tenth of a grain of morphine with the suppository, and administer this at night and morning. It certainly ministers to the local rest of the part, and it renders rest in bed much more endurable in persons of a nervous tendency.

Certain good results may be gained by applications to the ulcerated spot by means of enemata, and when the disease is situated high up the amount of fluid injected should be large. Three pints of water may be thrown into the upper part of the rectum, the sigmoid flexure, and the lower part of the colon, if the proper means be adopted, without causing any uneasiness at the time or any subsequent desire for an evacuation. Long, flexible, soft-rubber tubes may now be obtained from any of the surgical-instrument makers, which are suitable for this purpose. The tube should be small and the opening in it just large enough to hold securely the smallest end piece of an ordinary Davidson's syringe. The injection should be given with the patient on the side, and given slowly. The drug from which the best results may be expected when used in this way is the nitrate of silver, and the solution should vary in strength from twenty to forty grains to three pints of water. This plan of treatment has recently been very successfully employed in cases of dysenteric ulceration. Dr. Mackenzie[1] reports five cases of cure by it, and in one of them, where the disease had lasted two years and a half, the cure followed a single injection.

The knife may serve a good purpose under several circumstances. Where the sore is of small dimensions and well limited in outline, even though it be above the external sphincter, it is

[1] "On the Treatment of Chronic Dysentery by Voluminous Enemata of Nitrate of Silver," The Lancet, April 22d, 29th, 1882.

sometimes of advantage to draw the knife across the muscular fibres which form its base, and secure rest for it in this way. The operation is one of delicacy, but is also one which may assist greatly in the cure.

In cases of more extensive disease above the sphincter and

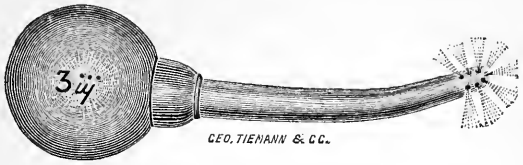

Fig. 115.

at its level, where the latter by its action causes constant pain and suffering (and, indeed, ulceration of the rectum is seldom very painful unless the sphincter is involved, and, in advanced cases where it has been entirely destroyed, may be almost painless), I am in the habit of freely dividing that muscle in the me-

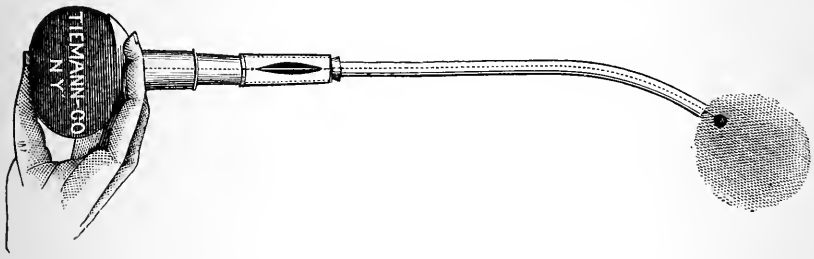

Fig. 116.—Insufflator.

dian line posteriorly by a single incision through all its fibres. In this way relief is given to suffering, more perfect rest is obtained than is otherwise possible, and a way is opened for such further local treatment as may be necessary.

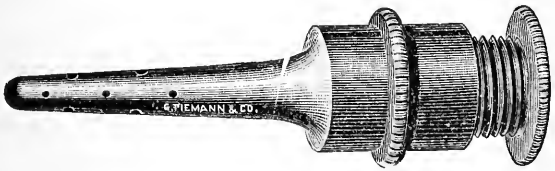

Fig. 117.—Ointment Applicator.

The operation is preferable to that of stretching the muscle, simply because its effect is more permanent; and, indeed, is a substitute for colotomy in the same class of cases. Of this operation I shall say more in the next chapter when speaking of the most frequent secondary effect of ulceration—stricture.

The application of strong nitric acid to a circumscribed ulcer of the rectum is often attended by the happiest results.

In treating these cases by local applications the surgeon must be prepared to ring all the changes between a two-grain solution of nitrate of silver and fuming nitric acid, or pure carbolic acid. They are cases which require the utmost care, both as to the diagnosis in the first place, and the treatment; and many of them will end unhappily in spite of all that can be done. And yet, when they present themselves in their earlier stages, before irreparable injury has been done, they are capable of being cured by the treatment which has been outlined.

I now remember but one case of simple ulceration which I have failed to cure by one method or another, but it has often been by several combined, and only after months of treatment and the heartiest co-operation of the patient. In many cases the cure has been easy after the diagnosis has been made complete; and this has especially been the case where circumscribed ulcers within the bowel which have long resisted treatment have been found to depend upon blind internal fistulæ.

The practitioner should be very cautious in his prognosis as to the time required for treatment, remembering that it will of necessity be long. When local treatment within the bowel is required, I believe the speculum shown in Fig. 22 will be found most convenient. It was invented especially to meet a want in my own practice. When weak astringent applications are indicated they may be conveniently applied by means of the bulb shown in Fig. 115. For strong applications of acid a little cotton on the end of a flexible probe is the best instrument. A saturated solution of nitrate of silver may also be applied best in this way, and its action can be better controlled than can the effect of a solid stick. For powders such as calomel, bismuth, and iodoform, the insufflator shown in Fig. 116 answers a good purpose; and the best ointment applicator is shown in Fig. 117.

To accomplish anything with either tubercular or lupoid ulceration the treatment must be begun early. If a tubercular ulcer be completely excised or destroyed with the cautery before general symptoms of tuberculosis have shown themselves, there is a chance that it may be cured; and if lupoid ulceration be attacked before it has done irreparable injury, and thoroughly scraped out and burned, it may also be induced to heal. Otherwise colotomy may be the only means of palliation.

CHAPTER XI.

VENEREAL DISEASES OF THE RECTUM AND ANUS.

The venereal diseases of the rectum constitute a study which has never yet been mastered by either the syphilographer or the student of diseases of the rectum. Each has contributed a certain amount of information acquired by personal experience, but neither has ever completely covered the whole ground.

The difficulty with the syphilographer in general is that he is not thoroughly familiar with rectal exploration and diagnosis, and with the rectal specialist that he is not an authority on venereal diseases. Many manifestations of syphilis escape the former because, as a rule, they are out of his field of vision and beyond the reach of his usual examinations; while many are brought to the notice of the latter, not at all because they are venereal, but because they cause pain and trouble with the rectum.

For this reason it has seemed to me that a review of the whole subject might be profitable, not so much from anything original which it may contain as from a concise statement of what is definitely known and what is still to be learned. The field of observation is one in which every observer's clinical experience is of the highest value, for many of the points which still give rise to debate may easily be settled by a few accurately reported cases.

The term venereal diseases will be used here in its broadest sense, as including all those affections referable to, or directly caused by, the sexual act; and the number of such is very considerable, for there is scarcely any manifestation of venereal disease capable of affecting the soft tissues which has not at some time been observed in the rectum or anus.

Before considering the various forms in detail, a few words are almost unavoidable as to the modes of their acquirement. Some of them are local, some are the manifestations of a constitutional poison. The local ones may be acquired by accidental contact or by the practice of unnatural sexual vice. However

disgusting this last phase of the etiology of venereal disease may be, it cannot be set aside as a matter of ancient history nor utterly disregarded in the practice of medicine of the present day.

For statistics regarding the extent of these unnatural practices we are in great measure dependent upon the French and German writers upon legal medicine. All through French medical literature we find references to sodomy and pæderasty as common crimes, about the existence of which there can be no discussion. Kocher, in his work "De la Criminalité chez les Arabes," begins his chapter on this subject with the concise statement, "Like all the people of the Orient, the Arab is a sodomist," and remarks on the special frequency of the habit in those countries where polygamy is allowed, using the apt expression, "moral hermaphrodite," for a man addicted to the practice. He quotes Bertheraud in calling attention to a peculiarity in the dress of the Arabian pæderast. The ample Turkish pantaloons are provided with an opening at the site of the anus, which, together with the stains surrounding it, constitutes valuable legal evidence.

The most important statistics, however, come from France. Martineau[1] says: "The frequency of sodomy is great, as you may judge from the cases seen every day in my service. Since my lectures on this subject in 1881, I say it with regret, deformities of the anus due to this act against nature have become more and more numerous, proving that these libidinous practices increase from day to day. If I dare express the results of my observations, I should say that for many years I have noticed an evident increase in these acts. Saphism, lavage, and sodomy grow in unheard-of proportions." Out of 1,170 observations made during the year 1880 he found 500 cases of vulvar or anal deformities due to masturbation, saphism, or sodomy.

Tardieu[2] numbers his cases of pæderasty by the hundreds, and classifies them as follows: Passive, 139; active, 32; both active and passive combined, 101; not mentioned, 30. Of these 302 cases 78 were servants, 54 shopkeepers, 16 soldiers, 12 tailors, and 142 belonged to 60 different trades. As to age, 32 were under 15 years, 88 between 15 and 25, 40 between 25 and 35, 39 between 35 and 45, 35 between 45 and 55, 6 between 55 and 65, 5 between 65 and 70, and 57 not mentioned.

These figures may be open to criticism, as may the statements

[1] "Leçons sur les Déformations vulvaires et anales," etc.

[2] "Étude Médico-légale sur les Attentats aux Mœurs," 1878.

of Martineau, on the ground that both believe so implicitly in the physical changes supposed to result from the habit that they may have argued backward from certain appearances of the anus to the existence of the vice, and in some cases the inference may not have been correct.

A few words as to the exact uses of terms. Sodomy is a general term for all forms of unnatural intercourse, regardless of the sex of the parties. It is also applied to intercourse between the human race of either sex and the lower animals, and in current literature has too general an application to convey any definite idea of the particular form of vice indulged in. In its more correct and limited application it refers to the act of sexual intercourse *per rectum*, where the passive party is a woman and the active a man.

Pæderasty, properly defined, is rectal intercourse where both parties are males. The Greek παῖς signifies a youth, and not necessarily a boy; but in modern literature the word is applied only to males and without regard to age. The terms active and passive, as applied to pæderasts, sufficiently explain themselves.

Buggery, sometimes used synonymously with sodomy, means, properly, sexual intercourse with one of the lower animals. It is derived from the French *Bougre*, the name of a religious sect in Eastern Europe—the Bulgarians—but is not held as any imputation against their practices. Of this vice there are many forms, some of them of direct interest in this study, and others not.

Greek-love is another name for pæderasty, the practice having come into Greece from the older civilization of the East.

Besides these practices there is one other—rectal masturbation—which is of direct interest in causing the lesions about to be described.

The existence of these habits is explained by the physiological fact that a certain degree of sexual orgasm may be excited in either sex by the irritation of the rectum and anus. It may be safely assumed that no man would give himself up habitually to be the passive party in this practice unless such were the case. The habit of rectal masturbation (the irritation of the anus and rectum by the introduction of foreign bodies, such as bottles, candles, or sticks of wood) can only be accounted for in this way. There are, moreover, some clinical observations which seem to indicate that the capability of producing an orgasm in this way may outlast the natural sexual power. The men

addicted to rectal masturbation are generally old and sexually incompetent.

The following case, reported by myself at a meeting of the Clinical Society, is one in point.

A man in the middle class of life, the steward of a steamboat, forty-five years of age, fat, round, and flabby, consulted me about an occasional loss of blood and considerable pain during and after defecation. The most careful examination failed to detect any lesion, both anus and rectum seeming perfectly normal. After prolonged questioning I was about to give up the diagnosis in despair when the patient, seeing my evident perplexity, suggested that perhaps he ought to tell me one thing. It was this: He had practised masturbation during the early years of his life, but about fifteen years ago he had begun the practice of passive pæderasty, and had continued it steadily ever since. For some time he had noticed that each indulgence was followed by pain and hæmorrhage. What he really wanted to know was whether he had received any physical injury or acquired any venereal disease. He was a married man, but without active sexual power.[1]

The voluntary practice of these vices being thus accounted for, there still remain many cases in which their existence is to be explained in other ways. Male children and physically weak male adults have not infrequently been made the passive parties by force and violence. Many women submit to it from love of gain, and others, when married, because forced to do so by the unnatural demands of the husband. The fear of pregnancy, vaginismus, imperforate hymen, or any painful disease of the vagina may account for the practice. But these explanations are by no means sufficient to account for all cases, for Martineau refers to the fact that in certain countries of Europe, Asia, and Africa young girls, from the age of eight upward, give themselves freely to anal intercourse, because the shame of this habit is less than that which would attach to the fact of having lost their virginity, when they came to be married.

There are many points at which this subject comes within the field of the alienist and neurologist rather than that of the surgeon. It is easier to understand why a man or woman should submit to rectal intercourse than why a man should practise sodomy upon a woman, often his wife. That the sexual appetite is capable of almost every conceivable perversion history only too clearly proves.

[1] New York Medical Journal, August 7th, 1886.

As to the existence and extent of these practices in this country but little is known and less has been written. This very ignorance on the part of physicians, and lack of medical literature on the subject, go far to prove that the vice cannot have reached any such proportions here as must be the case in France to justify Martineau's statement that, although the practice is particularly common among prostitutes, it is no necessary part of their profession, and that he sees much of it among women whose social habits and standing remove them from all suspicion of unnatural practices, and in cases where, unless the physician has made an attentive study of anal deformities, he is liable to misconstrue the origin of the local and general symptoms which depend on the act.

Sodomy here must be sought for among prostitutes, and pæderasty where bodies of men and boys are banded together and separated from the opposite sex for a long time, as on board ship.

The French writers describe in detail the changes, malformations, and diseases of the rectum and anus produced by this practice, and it is on account of these only that this subject has been introduced. It is a well-attested fact that all of the supposed physical signs of the vice may be absent in those who have practised it for years. The case reported by myself is one in point, and Kocher calls especial attention to the fact that among the Arab pæderasts all of these signs are generally absent. Ligg[1] describes a deaf-mute, thirty-five or forty years old, the victim of this habit, whose anus showed no trace of traumatism and was well closed, being marked only by an absence of the radiating folds. The mucous membrane of the rectum was also normal.

Although there is a perfectly normal type of anus, the changes which may be found in it without indicating disease are numerous. The tonicity of the sphincter differs greatly in different people in health. In some a Sims No. 8 speculum may be introduced without pain, while others can hardly tolerate the index finger. In some patients the radiating folds of skin are very strongly marked, while in others they are entirely absent; and the depth of the anal depression varies most strikingly in different people.

The changes which unnatural intercourse is supposed to produce are relaxation of the sphincter, disappearance of the radiating folds, and an infundibuliform shape of the anus, together

[1] Corr. Bl. f. Schweiz Aerzte, No. 3, February 1st, 1879.

with, in more marked cases, fissures, lacerations, abrasions, ecchymoses, ulceration abscess, hæmorrhoids, fistulæ, and incontinence. There is no doubt but that all of them may be produced in this way, but only under extreme conditions. It certainly would lead to error, however, to infer the existence of an unnatural practice from a lax sphincter or an absence of radiating folds in every case, or even in the majority of cases. In studying these changes and their value in diagnosis, it will be safer to admit that, although the prolonged practice of the vice may certainly cause them to appear, they may still all be absent in old cases, and their mere presence will seldom constitute proof of the practice without additional evidence, usually only to be obtained from the confession of the patient.

The physical signs which indicate this vice are of two kinds —those due to physical violence and those due to direct contagion of venereal poison. The former will vary according to the age of the passive party, the tightness of the sphincter, the size of the male organ, the amount of violence used, etc., and also according to the frequency of the act. In a young child, and sometimes in an adult, the injury may amount to actual laceration, and may be attended by profuse hæmorrhage in consequence; but it is more apt to show itself in abrasions, bruising of the parts, and ecchymoses. These injuries may be followed by abscess, and hence by resulting fistulæ. A case of ischiorectal abscess was called to my attention not long since, supposed to be caused in this way, and, at all events, occurring in a confessed pæderast. In less marked cases a single act may be followed by pain in the rectum, increased by defecation, tenderness to the touch, slight erosions, and perhaps by a slight serosanguinolent or mucous discharge. In cases of long-continued practice, where marked changes have been caused, the physical signs are of a different character. Tardieu illustrates his work with a plate of a patulous anus, in which the sphincter is entirely paralyzed; and Burgeon[1] describes the rectum of an idiot, who for a considerable time had practised the vice, as much dilated and infundibuliform in shape, the mucous membrane being blackish, swollen, and ulcerated in spots, and the submucous and muscular layers hypertrophied to four or five lines in thickness. In such cases there will be incontinence of gas and fæces, fistulæ, and perhaps stricture following the ulceration.

With regard to the diagnosis in these cases, it will be seen that none of the signs enumerated are absolutely diagnostic,

[1] Bull. de la Soc. Anat., 1830, p. 80.

though they may be sufficiently so to excite the strongest suspicion. Pæderasts are said to recognize each other almost invariably, and certain general characteristics are said to be common among them, such as an affectation of femininity, the use of perfumes, wearing of jewelry, a mincing gait, curled locks, exposed neck, etc.; but about the only absolute proof of the habit, when it is denied by the criminal, is the finding of spermatozoa either on the mucous membrane of the rectum or in the discharge from it.

The injuries caused by the practice of rectal masturbation are often much more severe than those due to sodomy or pæderasty. It is this secret vice which lies at the bottom of all the remarkable cases of foreign bodies found in the rectum, generally of old men who have lost natural power. A bottle in the rectum explains itself, and it is useless to call out the story of diarrhœa or constipation with which the sufferer always provides himself.

One reason for the fatality of these cases is found in the length of time the true condition will be concealed by the patient before his shame allows him to seek medical relief; and another is that in the futile attempts to remove the body made by the patient it is generally pushed farther up, or if friable is broken.[1]

Leaving, with this brief outline, the physical changes which may result from these practices, we come to the other venereal diseases of the rectum and anus which may be caused by them or in other ways.

Proctitis due to sodomy or pæderasty may be either simple or gonorrhœal. The former is due to mechanical violence, and its presence without palpable cause, and associated with an eroded condition of the anus, is sufficient to excite a suspicion of the vice. The symptoms are a sensation of heat and weight in the part, a frequent desire to go to stool, more or less pain, often extending to the bladder, sacrum, and loins, and causing vesical tenesmus and a discharge of sero-purulent matter with the passages and between them.

With these local symptoms there may be more or less fever and loss of appetite, and an examination will reveal local rise in temperature and a congested state of the mucous membrane.

True gonorrhœa of the rectum, arising either from direct contagion or by inoculation with pus flowing from the vagina

[1] Poulet: "Foreign Bodies in Surgery." New York, Wm. Wood & Co.

over the anus, is very rare. Rollett [1] reports a case due to direct inoculation from the penis to the rectum in a patient who was in the habit of introducing his finger into the bowel to provoke a passage.

Tardieu has never observed a case, and Gosselin [2] saw only one at Lourcine in three years.

In some experiments made by Bonière,[3] he found it very difficult to inoculate the rectal mucous membrane with gonorrhœal pus placed upon it through a tube, though the anus was easily affected. On the other hand, Requin [4] believes it almost sure to follow passive pæderasty with a person suffering from the disease.

Individual cases will occasionally be seen reported, and most of the standard writers acknowledge its existence.[5] In my own practice I have never had occasion to suspect its existence but once, and then I could not be positive; the patient—a woman—denying any unnatural intercourse, and there being another explanation of the condition equally good.

The diagnosis must rest upon the confession of the patient, the existence of the deformities which point to unnatural intercourse, the severity of the inflammation, and the microscopic examination of the discharge. In gonorrhœal proctitis all the symptoms will be more severe and acute than in any of the simple varieties. The pain is more severe, the discharge very abundant and greenish in character, escaping with the stools and also by itself; the finger introduced will at once detect the increased heat of the part, and a speculum examination will show intense redness and congestion. The mucous membrane is covered with thick discharge, bleeds readily when touched, and the follicles are enlarged and discharge pus. Although a very severe proctitis may be caused by other causes than gonorrhœa—such, for instance, as the prolonged use of drastic purgatives—the history of the development of the disease will be much more chronic.

The irritating discharge from the anus may cause erosions and fissures, or previously existing fissures may become inoculated with gonorrhœal pus and spread in superficial extent. The

[1] "Dict. Enc. des Sci. Méd.," article "Rectum."

[2] Arch. Gén. de Méd., 1854.

[3] "Récherches nouvelles sur la Blennorrhagie," Arch. Gén. de Méd., April, 1874.

[4] "Éléments de Path. Méd.," t. i., p. 729.

[5] Thiery: Presse Méd. Belge, No. 26, 1882; Dunmire: Philadelphia Medical Times, vol. xii.; Bumstead and Taylor; Vidal.

inflammation of the mucous membrane of the rectum may be so severe as to end in ulceration and loss of tissue.

The treatment consists in rest in bed, hot sitz baths, anodyne injections of warm starch water and opium, and perhaps of a solution of nitrate of silver (1 or 2 grs. to ʒ i.). The diet should be of milk and fluids, and the bowels should be kept gently acting with salines. By this means a cure may generally be effected in a fortnight or three weeks.

Chancroids at the anus may be caused by direct contagion or by auto-inoculation, and though they may be due to unnatural intercourse, their presence is no proof in itself of the vice. They are much more common in females than males, constituting one in nine of all cases of chancroids in the former, and only one in four hundred and forty-five in the latter. To account for this disproportionate relative frequency it is only necessary to remember the possibility of accidental contact of the male organ in coition, and the facility of auto-inoculation due to the proximity of the rectum and vagina.

They may be single or multiple, may be situated at any point of the anal circumference, and may cover a large extent of surface. They often extend upward between the radiating folds of skin, and thus greatly resemble simple fissures; or they may spread backward into the fold between the nates, following in extent the natural course of the discharge; but they do not tend to spread upward into the rectum, or to involve the surface of the gut above the line of the sphincter. When they do so, which is rarely, they are of limited extent and well circumscribed. Their existence in the rectum proper has been denied by good observers, the mucous membrane there being believed to furnish no suitable ground for their inoculation.

These sores at the margin of the anus have the same general characteristics as when located in other parts. The base is soft and covered with the same grayish pellicle, the edges are sharply punched, and the secretion is profuse. They tend to spontaneous cure with cleanliness or with judicious cauterization, and are not very painful unless they are within the grasp of the sphincter, when they may cause the usual pain of fissure. Even when they have extended upward in this way they still heal kindly, and almost spontaneously; and no matter how completely they may have involved the anus or the surrounding skin, they seldom, when healed, leave any traces of their former existence.

In certain rare cases they may be accompanied by an undue amount of ulceration, known as phagedæna; and in certain

patients with other rectal disease, or in whom the scrofulous or syphilitic taint is marked, they may assume a chronic type and the healing be delayed for a long time; but even they may generally be induced to heal with proper care.

From this general description it is evident that only under very exceptional circumstances will a chancroid, even when phagedenic, extend far enough into the rectum, and cause sufficient destruction, and subsequent cicatrization and fibroid deposit, to result in stricture. That it may do so we are almost forced to believe from the testimony of others; but it is none the less a clinical fact that it seldom does do so, as all those having large experience with venereal sores will testify.

Ulceration of the rectum, in my experience and that of others who have devoted special attention to the diseases of the rectum, *begins within the rectum proper*, well above the sphincter, and not at the skin of the anus, except in some rare cases of lupus, tubercular disease, and rodent ulcer. In the old cases of syphilitic stricture of the rectum, in which the anus is surrounded by tags of hypertrophied skin with ulcers between them extending upward into the gut, we have no proof whether the ulcers were present before the stricture or resulted from the stricture. The cases are always too old, the conditions too complicated, and the history too confused and imperfect for a positive opinion on this point. In any case of stricture of the rectum, venereal or not, there is generally ulceration below and above, and most frequently a circle of hypertrophied tags of skin around the anus, the adjacent surfaces of which are eroded and ulcerated. To assert that these ulcers are the original cause of the stricture is to assert what has never been proved, and what it is obviously impossible to prove without very careful and prolonged observation of individual cases.

Gosselin is usually quoted as the authority for the idea that chancroid of the anus is the most frequent cause of ulceration, and of the so-called syphilitic stricture of the rectum. It is rather difficult to tell exactly what Gosselin did mean in his much-quoted contribution to this subject, but there seems very little ground for supposing that he intended to convey this idea. Although Bassereau had made the distinction between chancre and chancroid two years before, Gosselin's "chancre" still meant to him, indiscriminately, the hard chancre, the chancroid, and the mucous patch inoculated by the chancroid. What he asserts is, that these strictures are neither primary, secondary, nor tertiary manifestations of syphilis, as such are generally

understood, but something developed in the neighborhood of the primary sore, comparable to hypertrophy of the labia or condylomata following the primary lesion. They are "due to a special modification of the vitality of the tissues contaminated by the virus of the chancre, comparable to the lengthening and hypertrophy of the prepuce with contraction of its orifice which follows a chancre on its under surface, in which the disease is evidently neither an œdema, nor a specific induration, nor a constitutional affection, but a local lesion, due to the presence of the chancres, and consecutive to the inflammation which they have caused."

This opinion can certainly be made to teach the chancroidal nature of the affection only by a considerable exercise of the imagination. Nor can very much be said for the theory itself, except that it seems to be rather a doubtful way of accounting for a condition of doubtful etiology, and one which has never been accepted by the profession.

Dr. Mason's [1] paper is very much stronger than Gosselin's, in that he plainly asserts the causation of stricture to be the phagedenic chancroid. He says he has seen "constriction of the rectum follow, and that very *shortly after* the healing of chancroids has taken place." Van Buren says: "I have also seen chancroids at the anus become phagedenic and extend within the rectum, and have verified, at a later period, the existence of stricture of the rectum from the cicatrization, as there was every reason to believe, of this same ulceration."

Bumstead and Taylor speak in the same way, and Mollière says: "Nevertheless the soft chancre of the rectum does exist, and has even been seen to assume frightful proportions in this deep region." Bridge's [2] case is much relied upon to prove this point, though it is open to grave criticism. The woman had both stricture and ulceration at the time the case was first seen, and there is no positive proof that the ulceration was chancroidal and not syphilitic.

The weight of evidence is thus seen to be decidedly in favor of the possibility of the causation of stricture by phagedenic chancroid, but that any large proportion of venereal strictures are caused in this way certainly cannot be accepted, and this is one of the points upon which further clinical evidence is especially desirable.

The diagnosis of the chancroid in this location will be easy

[1] Amer. Jour. Med. Sci., January, 1873.

[2] Arch. of Dermatology, January, 1876

by auto-inoculation, if the probability of its occurrence is only borne in mind, and the treatment has been sufficiently hinted at. Cleanliness, local application of astringents, and attention to the general health are all that is necessary when the sore does not extend beyond the radiating folds.

There are two forms of phagedæna which may complicate a chancroid at the anus—the acute and chronic. The former is rare, and strongly resembles phlegmonous erysipelas following a wound, in that it may involve the tissues to a great extent, cause deep collections of pus and destruction of tissue, and end fatally. The chronic is the one generally seen, and this may go on for a long time, healing in one spot while advancing in another. It is worthy of note that even after months of this process the sore still remains auto-inoculable.

There are other complications of the chancroid which may render the diagnosis difficult. The sore may itself be inoculated with syphilitic virus and assume some of the characters of the hard chancre, especially the induration. In such a case the diagnosis must rest in a great measure upon the combination of symptoms. The sore will present the appearance of the chancre, but the discharge will be more abundant than a chancre generally produces, and the pus will still be auto-inoculable. In addition, the glands in the groins will show the characteristic syphilitic induration.

Mollière has pointed out that the combination of hæmorrhoids and anal chancroid may cause certain peculiarities in the course of the latter. The sore may, after a time, lose its auto-inoculability, but still refuse to heal, the surface becomes red and vascular, the discharge sanious, and the sore is changed into a veritable varicose ulcer.

In the treatment of chancroids of the anus many points of difficulty may arise. The sore, from its position within the grasp of the sphincter, may be so painful that nothing can be done to it except by the surgeon himself, and only then by the exercise of the greatest care and gentleness of manipulation; and although this pain may be at once relieved either by incising the ulcer or dilating the anus, both of these procedures involve a great risk to the patient of auto-inoculation. The bowels should, therefore, be kept gently open by the daily administration of a laxative which will cause soft but not watery passages. The ulcer must be touched two or three times daily with a weak solution of nitrate of silver (grs. v.–℥ i.) on a camel's-hair brush, and subsequently covered with a small pledget of soft lint

gently laid into the fissure and pressed down with a probe. With a light touch this may be done without causing pain.

Should the ulcer have extended upward to the upper edge of the sphincter, there may be such contraction of the muscle that this plan of treatment is impracticable, because all parts of the sore cannot be reached by the brush. In such a case ether or cocaine must be resorted to, a speculum introduced until every part of the ulcer is exposed, and the surface thoroughly cauterized with fuming nitric acid. The acid must be carried under the edges of the ulcer, and every point must be thoroughly destroyed, for the operation will be positively injurious unless thoroughly done.

Should the ulcer have reached such an extent of rectal surface as to render it doubtful whether by any means of exposure every point of it can be fully seen, it is better not to try cauterization, but to be satisfied with astringent injections frequently repeated. These must also be made either by the surgeon or a thoroughly well-trained and skilful assistant, for no fresh wounds must be made by the point of the syringe, and no pain need be caused by its passage. A small glass point or a small soft-rubber catheter must be gently introduced on the side opposite the ulcer, and about four ounces of water thrown up and passed out to clean the surface of the sore. This should be followed by about two ounces of a solution of nitrate of silver (grs. ij.–℥ i.), and this application should be repeated at least three times in the twenty-four hours.

Phagedæna in the chronic form must be treated by destructive cauterization, preferably with the Paquelin cautery, and every part of the ulcer must be completely destroyed. Subsequently anodynes may be freely used till the eschar separates and a healthy granulating surface remains. In the acute form of phagedæna free incisions may be necessary in the fossæ and over the buttocks to let out pus and relieve tension, as well as the destructive cauterization of the sore.

True chancre at the anus is not very uncommon, though it often passes unnoticed from the slight annoyance caused by it. In men its presence is very positive proof of pæderasty, there being no chance of accidental inoculation as in women. When, therefore, Péan and Malassez give the proportion of one chancre at the anus to every one hundred and seventy-seven in other parts of the body in men, they also give some idea of the amount of unnatural vice existing in Paris. The same observers give the proportion as one in thirteen in women. Jullien gives a

higher relative frequency—twenty-one of anus and perineum and four of the buttocks in eighty-two women. These sores are most likely to be mistaken for simple abrasions, or, when between the radiating folds, for simple fissures. When typical in development they have the hard, raised outline and indurated base, but they are often mere erosions and strongly resemble the mucous patch. There is very little discharge, and what there is is not auto-inoculable. They tend to spontaneous healing, but they may develop into mucous patches. Glandular enlargements in the groins should always be searched for, and in doubtful cases constitutional treatment may be delayed until the appearance of secondary symptoms.

True chancre within the rectum has seldom been observed, though how common it may be as a result of unnatural intercourse will never be known, so little local and constitutional disturbance does it cause. Ricord, Fournier, and Vidal de Cassis each report a single case, and these are about the only ones recorded. In that of the last named the induration is said to have been so great as to cause stricture—a statement which must of necessity throw doubt upon the diagnosis. The difficulties attending the diagnosis of such a sore are manifest. Its mere appearance would scarce be conclusive, and the absence of any other sore which might be followed by general symptoms would need to be fully established, which in a woman is a very delicate thing to do.

The secondary manifestations of syphilis around the anal region are some of the syphilodermata, mucous patches, and condylomata.

Mucous patches are very frequent and assume two distinct forms, the ulcerative and the vegetating. The latter begins as a slightly raised red papule, which may after a time become a mere erosion or a distinct ulcer. They are generally multiple, and may be seated around the anus, within the radiating folds, looking exactly like simple fissures, or anywhere in the anoperineal region. They are easily confounded with either chancres, chancroids, or fissures, and the differential diagnosis may be extremely difficult, and only to be made by the history and the results of treatment. The points to be sought for are the raised edges and the grayish pellicle, which are not found in simple fissures.

The surface of a mucous patch sometimes becomes elevated by an upward growth of branching papillæ, with production of connective tissue and dilatation of the blood vessels. When

this development has reached a considerable extent, a cauliflower appearance is the result, and what was at first a simple mucous patch may become a large, warty vegetation surrounded by other similar growths which have sprung up around the original lesion and which are due to direct auto-inoculation. These are known as vegetating mucous patches, vegetating condylomata, condylomata lata, syphilitic condylomata, etc.; and

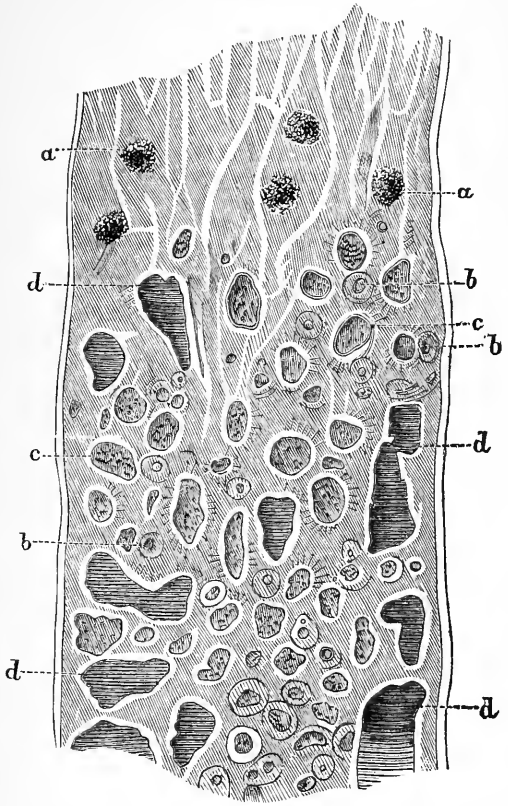

FIG. 118.—Syphilitic Ulceration of Colon. (Huet.) *a*, swollen follicles with gummy infiltration; *b*, commencing ulceration of follicle; *c*, ulcer showing submucous connective tissue; *d*, ulcer exposing muscular layer.

it is to them, to the exclusion of other warty growths of non-syphilitic origin, and of tags of hypertrophied skin, whether syphilitic or not, that the name of condylomata should be limited.

The vegetating mucous patch is particularly common around the anus, and sometimes grows to a large size, nearly filling the intergluteal cleft. The secretion is in the highest degree infec-

tious, and is also auto-inoculable. The spreading of the growth, where it comes in contact with a moist surface, may be accounted for by direct auto-inoculation, and also by the general syphilitic infection, which, at this stage, is particularly apt to manifest itself in mucous patches at any point in the body which is both moist and irritated. These growths are therefore found most developed in fat people of uncleanly habits in either sex.

The treatment is both general and local. Mercury is given for the syphilitic infection, of which these growths are the proof, and the sores themselves are treated by the application of calomel or iodoform in powder, by astringent washes, and the interposition of pieces of lint between the warts and healthy parts to avoid further local contamination. Should the growths not yield rapidly to this treatment, they may be freely destroyed by acid.

One point of great interest in connection with these syphilitic condylomata is that they very closely resemble (so closely that to distinguish between them by gross appearances may be impossible) another variety of warty growth which is often seen in the same place, but has nothing to do with syphilis, and may be entirely independent of any venereal disease whatever.

Do mucous patches ever occur within the rectal pouch? From analogy with the fauces alone it would probably be safe to answer in the affirmative; but this is one of the points on which clinical evidence is especially to be desired. Mollière[1] is the only observer with whom I am acquainted who has reported such a case. He describes a white, pearly, rounded plaque, in a subject evidently syphilitic, about one centimetre in diameter and five centimetres above the anus.

It is known that any ulcerative lesion, often of a very trifling nature originally, may in the rectum, under the influence of the irritation of the fæces, assume considerable proportions; and it has been assumed rather than proved that a mucous patch in the rectal pouch may in this way become the cause of destructive ulceration, subsequent cicatrization, and hence of stricture, so-called syphilitic. There is no clinical proof of this, as far as my reading goes, nor are we forced to accept any such theory, however probable and plausible it may be, to account for the strictures and ulcerations of the rectum which arise during the secondary stage of syphilis.

At this point we have to leave this question, with the others,

[1] P. 641.

for future accurate clinical observation, only observing that, as Mollière points out, at no other part of the body are mucous patches followed by retractile cicatrices.

Of the existence of syphilitic ulceration of the rectal pouch, occurring in the late secondary or early tertiary stage of the disease, there can be no more doubt than of the existence of the same condition in the fauces and trachea, where it is more easily discoverable and hence has been more often described. The ulcer is due to the deposit of syphilitic tubercle in the mucous membrane, which rapidly comes to the surface, disintegrates, and leaves a small, well-marked loss of substance, with clearly cut edges and yellowish, purulent base. When these ulcers coalesce there is sometimes great destruction of tissue, and large cicatrices follow their healing. Their favorite seat is the lower part of the rectum, and when found in great numbers they will gradually decrease in frequency as the bowel is followed upward.

This form of ulceration has been long recognized and has been thoroughly described, but better studied on the *post-mortem* table than in the consulting room. Curling[1] describes a case presented by the late Mr. Avery at a meeting of the London Pathological Society,[2] the history of which clearly shows the connection of the lesion with syphilis. "Immediately within the anus, which was surrounded by a circle of vegetations, the ulcer commenced, extending three inches upward and occupying the whole of the internal surface of the rectum to that extent. The edges were rough and uneven above, and below soft and rounded; the whole surface was smooth, exhibiting the muscular fibre of the intestine quite bare. When she died she had numerous indelible marks of syphilitic eruptions on the limbs and trunk, and was suffering from sore throat."

Paget,[3] also, has given a clear description of the disease, with the points in differential diagnosis between it and tubercular ulceration. He says: "The whole mucous membrane is destroyed except one small patch, which is thickened and opaque. The exposed submucous surface has a lowly tuberculated, undulating, uneven appearance, and is thickened by infiltration. In the early stages the tissue is soft, as if from recent inflammatory effusion or œdema; but as the infiltration organizes it hardens, becomes callous, with fusion of the mucous and submucous coats, and then contracts and thus brings about the stricture. The

[1] "Diseases of the Rectum," p. 112.
[2] "Trans. Path. Soc.," vol. i., p. 94.
[3] Med. Times and Gaz., 1865, vol. i., p. 279.

affection commonly extends from the anus, as if by continuity with the excrescence (condyloma), to about five inches up the rectum ; but it is rarely so marked in the first inch of the rectum as it is higher up."

"These ulcers are limited to the large intestine, and decrease in size and number from the rectum upward—conditions which, I think, are never observed in the tubercular disease. There is not a trace of tubercle—*i.e.*, of circumscribed, crude, or softening tuberculous deposit—in the submucous or any other tissue of the intestine ; none in a Peyer's patch, or at the base or edge of any ulcer. The shape and other characteristics of the ulcers are quite unlike those of intestinal tuberculosis ; they are regular, with sharp, even, well-defined edges ; with level bases ; they are not excavating, nor do they extend through the submucous tissue ; their edges are nowhere eroded or undermined, sinuous, thickened, brawny, or infiltrated ; the subjacent and intervening structures appear healthy, except at the rectum. These ulcers are not grouped, and where by extension or coalescence they have lost their first shapes, they have acquired one altogether irregular, and have in no instance even tended toward that girdle-like shape, encircling the canal of the intestine, which is so characteristic in the large, coalesced tuberculous ulcer. Thus by negative as well as positive characters these ulcers are clearly distinguished from the tuberculous, and, as I have said, there is no other form of intestinal ulcer to which they bear even a remote resemblance."

The amount of stenosis in these cases varies considerably. In some it is only such as is caused by the thickening of the surrounding structures ; in others extensive cicatricial contraction will be found superadded, and with it the results of stricture of the rectum.

This form of ulceration is, to my mind, entirely independent of any venereal lesion at the anus which may extend into the rectal pouch. It is syphilitic, and it belongs to a late stage of syphilis. It is, moreover, syphilitic ulceration of the rectum, and not of the anus, and it begins an inch or more above the external sphincter. While some observers have sought to establish that syphilitic stricture of the rectum was not syphilitic but chancroidal, and that it was due to an extension of an ulcer from the verge of the anus, the existence of this form of disease has not been denied, and it is to it that a certain number of syphilitic strictures are, I believe, to be attributed. This, of course, is in direct opposition to the views of Gosselin and Ma-

son; but those views have never been to any extent accepted, even by syphilographers, while those who have studied the disease from the standpoint of the rectum are unanimous in rejecting them. Cases similar to the following are not very rare in the practice of those who devote much attention to the rectum.

Male, aged thirty-one, single; has been under antisyphilitic treatment at the Hot Springs for some time back, and was sent from there to me. Gives full syphilitic history, and has some brain symptoms, relieved by specific treatment. For past eighteen months has had symptoms of ulceration of the rectum, the usual diarrhœa, with mucous and bloody discharge, etc. Two weeks before coming to me two ulcers were found in the rectum above the sphincters, and were cauterized, with relief to pain. On examination under ether, and with the anus well dilated, I discovered three separate and well-marked spots of ulceration about two inches within the anus. One was posterior over the tip of the coccyx, the other two were on opposite sides of the median line in front. The ulcers were raised and distinct to the touch from the exudation under and around them; the edges were distinctly marked, though not much indurated, and the bases a bright red and bleeding easily when touched.

The treatment was entirely local, as the thorough course of mercurials already given evidently had not accomplished anything, though giving much relief to the other signs of syphilis. The ulcers were thoroughly cauterized with nitric acid, and subsequently treated by local applications of bismuth and iodoform, while the patient was confined to bed on absolute milk diet. In one month all rectal symptoms had disappeared. Six months later the patient still continued well in the rectum, but had a decided return of the brain trouble, for which he again visited the Hot Springs.

For the past two years I have had under observation a case which illustrates very perfectly this form of disease in its more advanced stages.

The patient is an intelligent physician, aged thirty-eight. He has a full syphilitic history and various indisputable scars of the disease. Twelve years ago, while suffering from a tubercular syphilide, he first began to have the usual symptoms of ulceration of the rectum, and for this he had been under treatment for ten years before I saw him. On examination the lower four inches of the rectum, beginning within the anus and extending upward, was found ulcerated in its entire circumference, and in addition there was a free growth of fungoid granulation tissue

covering much of the surface. The wall of the bowel was inelastic and thickened, but there was very little contraction, and no stricture except what came from the partial closure of the calibre of the bowel by the fungous growth. The anus was partly surrounded by fleshy excrescences, and some of these were slightly excoriated on their anal surfaces, but the ulceration proper did not begin till the sphincter had been passed. Antisyphilitic treatment had never been of the least value for this condition.

At this time I strongly recommended the administration of ether, the thorough scraping of the diseased surface with a sharp spoon, and free application of strong acid to at least a part of the surface; this to be followed by the usual local and general treatment for rectal ulceration. But circumstances rendered this plan unavailable, and the patient disappeared for eighteen months. At the end of that time I again examined him, and found unmistakable stricture at two inches above the sphincter. The stricture presented all the characteristics usual in such cases, was of considerable extent, and admitted only a No. 8 bougie. This for a time was treated by dilatation.

This, to me, is a perfect example of late syphilitic ulceration beginning within the rectal pouch and going on to the formation of stricture.

It will be noticed that in this case the anus was surrounded by fleshy excrescences, and that these were excoriated on the anal aspect. The presence of such tags is not to my own mind a proof of the syphilitic nature of the disease above, any more than is the excoriation upon and between them the starting point and origin of the ulceration within the rectum. Both the excrescences and the excoriations are explained by the irritating qualities of the discharge from the ulcerative process above, and will be found equally in tubercular or cancerous disease.

This and one other are the diseased processes which explain the fact that in about fifty per cent of all strictures, not malignant, there is a full history of constitutional syphilis. Such a fact would not be disregarded in the study of the etiology of any other morbid process, nor should it be in this. If one-half of all non-malignant strictures occur in syphilitic patients, it is only fair to assume that syphilis has some causative influence.

In the differential diagnosis of syphilitic from other forms of ulceration, the history is of great importance. The appearance of the sore is scarcely characteristic enough to warrant a positive diagnosis unless all the facts of the case point in one direc-

tion; and the failure of antisyphilitic medication is of no negative value, for the late manifestations of syphilis in the rectum often refuse to respond to either mercury or iodide of potash, though both should always be tried. Traumatism, whether surgical or other, and dysentery may both be easily eliminated, and the only remaining sore at all resembling the syphilitic ulcer is the tubercular one. The diagnosis between these two may be impossible where only one or two spots of ulceration exist in the rectal pouch; but tubercular ulceration is not generally limited to the rectum alone, but rather tends to involve a considerable portion of the large intestine, being only more marked at the rectum.

The other tertiary manifestations of rectal syphilis are neoplastic in character. Circumscribed gummy deposits of greater or less extent have been quite frequently noted, and are scarcely as rare as would seem to be indicated by the statement of Fournier that he had never seen a case. Other observers have reported isolated cases, and R. W. Taylor has recently given the notes of four. The deposit may occupy any part of the circumference of the bowel, and in one of Taylor's cases was located in the recto-vaginal septum, and had ulcerated through, causing a fistula. The diagnosis of such a tumor, with its attendant ulceration, offers but few difficulties, and the treatment is both local and constitutional.

Instead of being circumscribed, this gummy deposit may involve the whole circumference of the bowel, and extend from the sphincter as far as the upper limit of the rectal pouch. This is what Fournier has described under the name of ano-rectal syphiloma, and what he believes to be the explanation of most of the cases of syphilitic stricture. For, although he recognizes that stricture may result from late secondary ulceration in the manner we have described, he believes that stricture from this cause is infrequent as compared with that produced by this diffuse deposit in the rectal wall.

As described by him the disease commences as an infiltration of the rectal wall by this neoplasm. The deposit is entirely submucous, and occurs by preference in the rectal pouch, and always encircles the whole calibre. It may also involve the anus, and may take the form of anal tags and tumors described when speaking of condylomata.

At first it merely causes thickening and stiffening of the gut, so that it loses its dilatability, but there is no contraction and no ulceration until later. As the deposit increases in amount,

the mucous membrane over it loses its vitality and becomes ulcerated, and the deposit itself finally degenerates into fibrous tissue, retracts, and causes stricture. This description of the gross appearances and general characteristics of syphilitic stricture will be recognized by all. Fournier was not describing any new affection, but simply, under a new name, "ano-rectal syphiloma," endeavoring to give a complete history of the origin and development of the ordinary syphilitic stricture as seen by every practitioner; and his description in many points corresponds with clinical experience. It must be admitted that in most cases of syphilitic stricture there is more infiltration of the rectal wall; more occlusion of the canal by hard masses of tissue; more extensive disease, in other words, than can easily be accounted for by mere cicatricial contraction; and it seems exceedingly probable that Fournier has more correctly described the true nature of the pathological process than any previous writer.

He does not attempt to describe the initial stage of the deposit. To him it is simply a neoplasm which degenerates and contracts. The whole question evidently turns on clinical observation. Unfortunately I have never seen, in my own experience, a syphilitic stricture in the early stage which he describes—an infiltration of the whole calibre of the rectum for a considerable distance longitudinally, but without any change in the mucous membrane covering it—and probably for the reason that he states, that in this stage the disease causes no symptoms. Syphilitic stricture, as generally seen, is just such a combination of ulceration, infiltration, and contraction as he describes ano-rectal syphiloma to be in its more advanced stages.

This affection is said by Fournier to be curable in its early stage (before degeneration and contraction have occurred) by specific treatment, but he has never seen but two such cases. Van Buren says that he also has seen the infiltration disappear under antisyphilitic treatment.

In addition to these tertiary manifestations of syphilis, Mollière describes a stricture of the rectum due to a specific inflammation of the rectal tunics. He says that in these cases the muscular coat is replaced by connective tissue, which by sclerosis causes atrophy of the muscular fibres. The origin of the trouble is in the muscularis, and not in the submucous connective tissue as with the other forms of stricture.

This is a form of disease which I have never seen.

CHAPTER XII.

NON-MALIGNANT STRICTURE OF THE RECTUM.

For convenience of reference the following table of the different varieties of stricture of the rectum has been prepared:

STRICTURE OF THE RECTUM.

- Congenital.
  - 1. Complete.
  - 2. Partial.
- Acquired.
  - 1. Pressure from without.
  - 2. Spasm.
  - 3. Non-venereal.
    - *a*. Dysenteric.
    - *b*. Inflammatory.
    - *c*. Traumatic.
    - *d*. Tubercular.
  - 4. Venereal.....
    - *a*. Cicatricial. (From Chancroid. From Secondary and Tertiary Ulceration.)
    - *b*. Neoplastic. (Gummata. Ano-Rectal Syphiloma. Inflammatory.)
  - 5. Cancer.

Congenital Strictures.—The congenital narrowing of the rectum, both complete and partial, which is sometimes seen, has been already described in speaking of the malformations of this part.

Acquired Strictures. 1. *Stricture due to Pressure from without.*—A tumor of any kind in the pelvis will not infrequently press upon the rectum so as to obstruct its calibre. An abscess in the ischio-rectal fossa may be accompanied by an amount of inflammatory deposit around the rectum sufficient to obstruct it, and a pelvic inflammation in women may be accompanied by an exudation which in the form of bands across the bowel shall partially close it, and at the same time lead to compensatory muscular hypertrophy of the rectal wall. Medical literature is

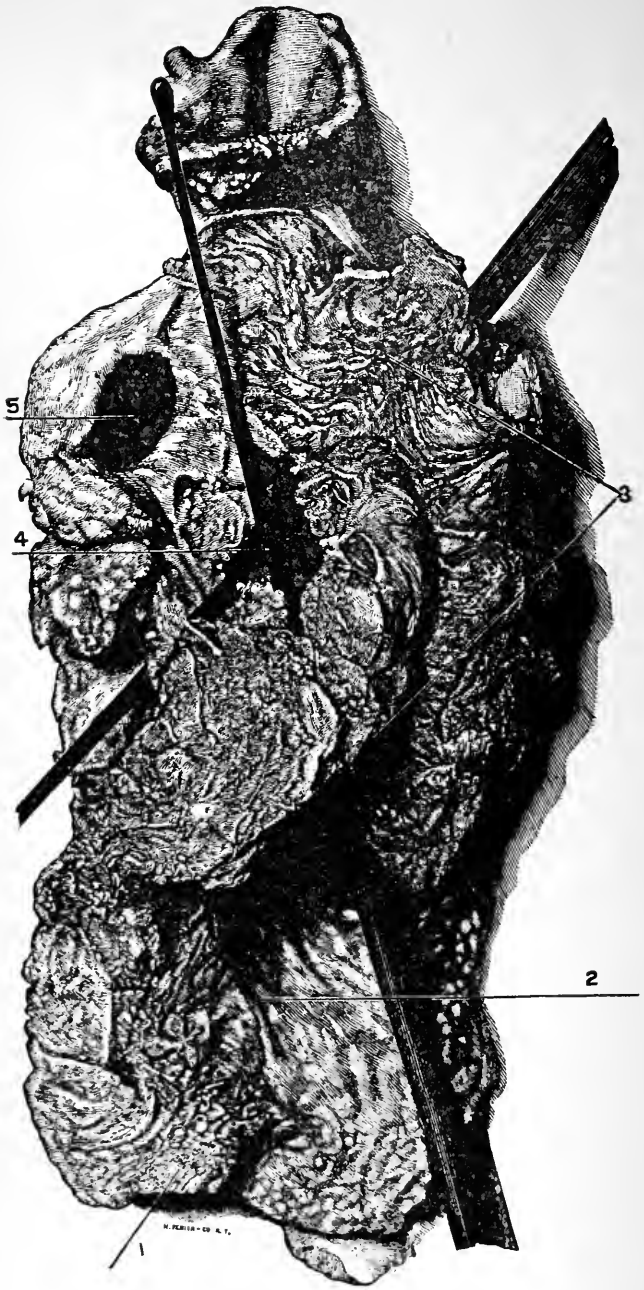

FIG. 119.—Stricture due to Plastic Exudation.

1, Anus. 2, Rectum. 3, Stricture laid open. 4, Abscess cavity communicating with rectum by perforations above and below stricture, as shown by the probes. 5, A small ovarian cyst.

full of cases of this nature, and here it is only necessary to refer to them as a not infrequent cause of obstruction both of the rectum and of other parts of the canal.

Fig. 119 is from a specimen in my collection, in which the sigmoid flexure was in two places almost completely occluded by plastic exudation.

2. *Spasmodic Stricture.*—Much has been written in times past upon the question of spasmodic stricture of the rectum, but at present the condition is looked upon by the best authorities with great doubt, if not with absolute unbelief. Spasmodic contraction or stricture of the external sphincter is not an unusual condition, and cases of it from my own practice and that of others will be reported further on ; but spasmodic stricture of the canal above this point has always been a matter of belief and assertion rather than of demonstration.

Allingham upholds its existence, in connection with organic stricture, as a complication of the latter, and gives the following case as proof. He says : " There are, no doubt, many cases of stricture in which there is very little deposit and much spasm, and there are, on the other hand, cases where much obstruction exists but very little spasm. A patient under my care at St. Mark's had a stricture so tight that I could not make the point of my little finger enter it ; on putting her under the full influence of chloroform, I could get two fingers through without difficulty."

This case, if it be admitted, as it generally will be on so good authority, actually proves more than has ever been proved before with regard to this question, and is about the only one which really proves anything. In my own practice I have seen this form of constriction, but never to such a marked degree as Allingham describes. I have already referred to the difficulty which often exists in passing a rectal bougie, from the natural conformation of the parts. It is upon this difficulty that nearly all the arguments for, and the supposed cases of, spasmodic stricture rest. When the bougie cannot be passed, a spasmodic stricture is supposed to be the cause. When, after numerous trials, by a lucky manipulation an entrance is effected, the spasm has been overcome. To this may be reduced nearly all the reported cases of this affection which from time to time have appeared in the writings of those who have devoted attention to the subject.

Mollière,[1] with his usual happy style, has gone very nearly to

[1] Loc. cit., p. 320.

the bottom of this question. He says that at a not very remote period there flourished by the side of Ashton, Curling, and the surgeons of St. Mark's Hospital, certain specialists as expert in finding strictures in the rectum as are our laryngologists in discovering polypi in the larynx. These estimable practitioners gave themselves up to the daily exercise of dilatation by bougies, and to facilitate the practice one of them had invented a pair of pants of a special pattern, dressed in which novel livery his patients came daily to have a sound introduced into the anus.

This whole question of spasmodic stricture has been very ably discussed by Van Buren,[1] and if the reader wishes to follow it further he can scarcely do better than to consult that article. Uncomplicated spasmodic stricture of the rectum is a thing whose existence is not admitted by the best authorities, and which will seldom be found by a skilful examiner. It is, perhaps, too much to say that it never exists ; but a well-marked case of it within easy reach of the finger, which could be plainly detected by an ordinary examination, and which disappeared under chloroform, is what those who do not believe in its existence are calmly waiting to see.

Nevertheless, as my own chances of observation have increased I have come to have greater faith in the occasional existence of this condition as a surgical curiosity, agreeing in this with Ball, Cripps, and other later writers. This much I have certainly seen. On introducing my finger into the rectum of a nervous woman, I have found it tightly grasped not only at the anus but as high up as I could reach. Leaving it there for a few seconds and gently palpating for disease, I have felt the whole canal open up—balloon out, so to speak—and leave the finger in a patulous, open cavity. If this may happen over the lower four inches of the gut, why may it not happen anywhere, and to a more limited portion of the muscular wall ?

I have also had a case more marked than this. The patient was a very nervous physician, worn out by suffering from rectal disease. His one chief symptom was pain in the rectum, caused by defecation and increased by the sitting posture, lasting often for many hours after a movement of the bowels. On touching the skin near the anus in an attempt to draw the parts open for inspection, I found the pain was so intense as to cause him to cry out at the least touch. With much gentleness the finger was passed through the external sphincter, and met by a

[1] "On Phantom Stricture and other Obscure Forms of Rectal Disease," Amer. Jour. Med. Sci., October, 1879.

stricture at about an inch above—in other words, at the level of the internal sphincter or slightly above. A few days later he was etherized, and before giving the anæsthetic this condition was again verified both by myself and my associate, Dr. Gibbs. The ether was then given, and not till profound narcosis had been reached did the constriction disappear. The patient was found to be suffering from hæmorrhoids, and an ulcer the size of a silver half-dollar, but quite superficial, over the internal sphincter. The cure of these was followed by the relief of all symptoms.

This was certainly a case of purely spasmodic stricture, but too near the anus to prove the point under discussion—spasmodic stricture of the rectum proper; though if we may have spasmodic stricture of the unstriped muscular fibres of the internal sphincter, why may we not have the same an inch higher up?

3. *Non-Venereal Strictures.* (*a*) *Dysenteric.*—Dysenteric stricture and ulceration have both been already described. Stricture due to this cause is, perhaps, more often multiple than when due to any other.

(*b*) *Inflammatory.*—Proctitis, whether acute or chronic, when attended by sufficient changes in the structure of the coats of the rectum, may result in stricture.

There is another form of stricture which may be considered as on the dividing line between the congenital and the inflammatory, and which consists in an enlargement and thickening of the folds of mucous membrane which are normally present in every one.

Quain,[1] under the head of impaction of fæces, describes the case of a man, aged forty years, who died with a large accumulation which was evidently due to the presence of two crescent-shaped shelves of mucous membrane projecting into the rectum, one attached opposite the prostate and the other about four inches higher. Each of these was more than an inch in breadth, and into each the circular muscular fibres fully entered, while even the longitudinal layer dipped slightly inward at their bases. Kohlrausch also describes an analogous case, in which he made an autopsy on a criminal who had been executed. (Fig. 120.) He found an enormous dilatation of the rectum above the spot at which he locates the plica transversalis. At that point he discovered an undoubted stricture which, from its hardness and extent, he at first considered cancerous. It presented, however, nearly the same anatomical condition as the one just described;

[1] "Diseases of the Rectum," p. 273, London, 1854.

the mucous membrane was sound and formed a considerable duplicature, the circular muscular fibre entered into this duplicature and formed a hard, hypertrophied, muscular ring several lines in thickness. The longitudinal fibres passed directly over the affected spot in this case, however, and were not unusually thick or firm, and the space left between the outer and inner muscular layers by the bending inward of the latter was filled with connective tissue. A stricture was in this way formed without degeneration of the mucous membrane—a condition, however, which led to no less serious results. Such a state furnishes in itself the ground for constant aggravation, for the longitudinal fibres passing entirely over the fold must, by each

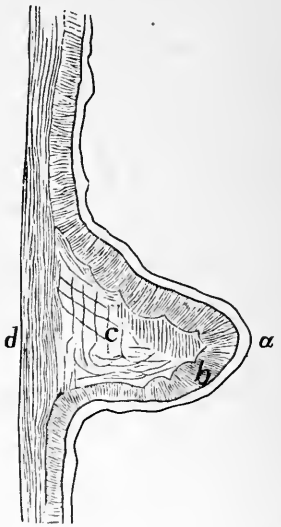

FIG. 120.—Longitudinal Section of Stricture of the Rectum at the *Plica Recti Inferior*. (Kohlrausch.) *a*, Mucous membrane; *b*, circular muscular layer entering into the fold of the stricture; *c*, cellular tissue; *d*, longitudinal muscular layer passing over the stricture.

contraction and by the necessary increase in their normal function, augment the substance of the fold more and more, and thus decrease the lumen of the gut. Nélaton, indeed, has written that valvular retractions of the rectum are most often only an hypertrophy of his superior sphincter, and that the projection formed by it into the cavity of the intestine is the point at which foreign bodies are most frequently arrested, as well as that at which invaginations in young children generally begin; and in all these points he is borne out by Velpeau.[1] Sappey[2]

[1] Velpeau, "Anat. Chir.," 3d ed., p. 39, 1837.

[2] "Anat. Descript.," t. iv., p. 222.

says: "At the level of this band most of the organic contractions of the rectum are situated; its study, therefore, offers no less interest in a pathological than in a physiological standpoint.' This idea of the pathological relations of the mucous folds and muscular bands in the causation of organic strictures may be traced through the works of Arnold, Tanchou, Hyrtl, and Houston, and has its foundation in the fact that, as these folds are the most subject to injuries, so they may be the most frequent starting point of those contractions of the rectum which are due to injuries, especially those from foreign bodies introduced *per anum* or swallowed, and from masses of hardened fæces, intestinal concretions, etc.

(*c*) *Traumatic.*—A simple traumatism may result in stricture, either by causing ulceration and cicatrization or by exciting a chronic inflammation in the submucous connective tissue. Amongst these traumatisms may be enumerated operations upon hæmorrhoids, applications of strong acids, the performance of some surgical operations, foreign bodies, kicks and falls, and the injury produced by the head of the child at birth.

(*d*) *Tubercular Stricture.*—There is no longer any doubt in my own mind that tubercular ulceration may result in narrowing of the canal, at least from induration and inflammatory deposit, if not from cicatricial contraction. I have seen this occur too palpably to be mistaken.

4. *Venereal Stricture.* (*a*) *Cicatricial.*—In the chapter on Ulceration, stricture has been frequently referred to as a not infrequent consequence of that process, and the various forms of ulceration which by subsequent cicatrization were capable of producing this result have been mentioned. In a general way it may be said that any ulcer which destroys even the thickness of the mucous membrane to any extent will, when healed, leave a cicatrix, and if such a cicatrix be at all extensive it will by its contraction cause subsequent diminution in the rectal calibre.

It has been shown that many of the more severe forms of rectal ulceration are of venereal origin. The venereal sores capable of producing a stricture are the chancroid and the later syphilitic ulcers. We shall leave out of consideration the true chancre and the mucous patch, for the reason that their influence in the causation of stricture is still rather a matter of surmise than of proof, and the same thing may be said regarding gonorrhœa of the rectum.

For a description of these ulcerative venereal processes the reader may again refer to the last chapter.

(*b*) *Neoplastic.*—There is a class of venereal strictures which are not primarily ulcerative, and therefore not cicatricial; these we have denominated neoplastic. In this class are to be placed the gummata; the ano-rectal syphiloma, which differs from gummy deposit rather clinically than microscopically, both of which have already been described; and a third late manifestation of constitutional syphilis, which is an inflammation of the rectal wall. This inflammatory change may involve a large portion of the rectum. It begins in the muscular fibre, the interstitial tissue of which becomes filled with round cells which ultimately form a connective tissue, and this connective tissue by its hardening and consolidation finally causes the complete destruction of the muscular element. This is not to be confounded with the ano-rectal syphiloma, in which there is an actual deposit of large masses of new material in the rectal wall—masses which it may be very difficult to distinguish from cancer.

In these various ways venereal disease, and especially syphilis, may result in rectal stricture, and this accounts for the fact that in about fifty per cent of all cases of stricture there is a syphilitic history.

Pathological Anatomy.—In studying the pathological anatomy of stricture, there are several points to be observed, for changes will be found not only at the stricture itself, but both above and below it, and in the surrounding parts.

From what has been said already, it will be inferred that a stricture which is not the direct result of a deposit of new material in the rectal wall will be composed either of cicatricial tissue, such as is found in other parts of the body, or else of connective tissue which is firm and dense and creaks under the knife on section. All the connective tissue in the rectum at the diseased point, whether submucous, subperitoneal, or intermuscular, will be found to have increased in quantity, and this accounts for the increased thickness of the rectal wall. (Fig. 121.) The mucous membrane at the seat of stricture will generally be found destroyed, and replaced by granulation tissue on this fibrous base, which bleeds easily when scraped.

Above the constriction a process occurs which will be found to be almost constant. This begins by a dilatation of the bowel and an hypertrophy of the muscular layer, with, at first, a thickening of the mucous membrane. Later, the mucous membrane, due, probably, to the irritation of retained fæces, will show all the stages of ulceration, from simple congestion in

some points to a complete destruction in others, and an exposure of the muscular tissue beneath. This ulcerative process may extend for several inches up the bowel. The wall of the bowel above the stricture may be as thin as paper in spots, and at such points perforation is apt to take place. In a case reported by Goodhart,[1] the changes of which we are speaking had gone on to actual gangrene, extending in spots along the transverse and descending colon, and were undoubtedly due to the intensity of the inflammatory action caused by the retained irritant matters. The bowel is also generally distended with gas and fæces, and the latter are more often fluid than solid, though fæcal tumors, with their well-known characteristics, will sometimes be met.

The dilatation above the stricture may reach an enormous size, and may ultimately result in a *cul-de-sac* or pouch which

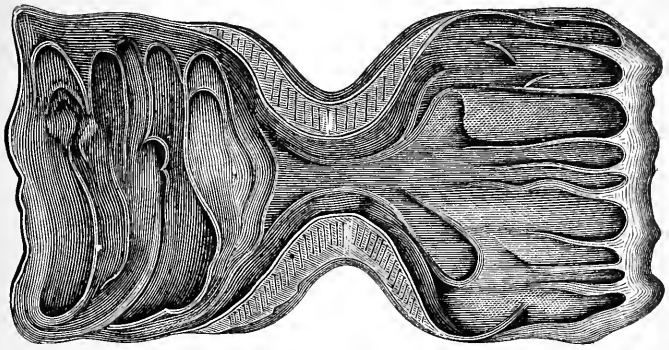

Fig. 121.—Stricture of the Rectum showing Hypertrophy of the Connective Tissue. (Bushe.)

will fill a large portion of the abdomen, and dip down below the point of constriction, and an ulceration in this pouch may result in its perforation and the establishment of a fistulous outlet for the fæces. Such an opening may be into the rectum, either above or below the stricture, or into the ischio-rectal fossa, with the necessary result of abscess. An opening may also be made into the bladder in either sex, and in females into any part of the genital tract.

As showing what efforts nature is capable of making to overcome the occlusion caused by stricture, the following account of the *post-mortem* appearances found in the body of Talma, the tragedian, is of great interest. The whole history of the case may be found in Quain.[2]

[1] Med. Times and Gaz., February 28th, 1880.

[2] Op. cit., p. 190.

In the examination of the body the intestines were all found largely distended with air and fæcal matter. . . . The pelvis was filled with an enormous sac—the upper part of the rectum largely dilated. When the sac was raised a circular narrowing of the gut was discovered. This was the stricture. It was at the distance of six inches from the anus, and proved, upon close examination, to be wholly impervious. It was, in fact, a solid fibrous cord, but on the surface irregular, and having the appearance of a purse, drawn tightly and puckered, with the strings tied around it. The great dilatation of the bowel at its lower end dipped down below the level of the stricture in the form of a dependent sac, in which was an opening about an inch in diameter, and from this opening issued a fluid, the same as that diffused through the abdomen. The rectum below the stricture was no more than the size of a child's intestine, and upon it, close to the stricture, was an ulcerated surface with a narrow opening, to which the edges of the aperture above the stricture had been adherent. A new communication, but an imperfect one, had thus been established between the two parts of the gut—severed one from the other by the stricture. But the connection had given way, doubtless in consequence of the violence of the expulsive efforts, and thus the contents of the bowel had escaped a short time before death.

The cellular tissue in the ischio-rectal fossæ around a stricture may also become hard and lardaceous as a result of chronic inflammation; and this change may extend to some distance from the original starting point along the sacrum, as high as the promontory, and into the subperitoneal tissue of the iliac fossæ.

Abscess is always liable to occur in the neighborhood of the stricture, probably from lowered vitality in the parts, and this accounts for the relative frequency of fistulæ in this disease. These may be both numerous and extensive, and may make communications between the rectum and any of the adjacent organs. For this reason a fistula should always lead the surgeon to think of stricture and to examine for it.

Allingham has also called attention to the frequent existence of a low form of peritonitis in connection with stricture, an inflammation marked by tympanites, vomiting, and pain, especially on walking or moving, and attended by thickening of the peritoneum and old and recent adhesions.

Below the stricture the rectum may sometimes be found unchanged from its normal condition, but it will generally be ulce-

rated as it is above, or else there will be hæmorrhoidal tumors, excoriations, and vegetations and tags of larger or smaller size. These growths are the result simply of irritation of the discharge from the process above.

Most strictures are located in the lower part of the rectum, and hence their presence is easily detected in the majority of cases. They are far more frequent in females than in males, because many of the causes which produce them operate chiefly in females. Age has little influence upon their frequency after the period of adult life. A stricture may or may not involve the whole circumference of the bowel; and the contraction may be so slight as not to be apparent till the bowel is distended with the speculum, when a falciform band may spring out from one side. In more extensive disease there is still usually a passage for the fæces, but this may be very slight. The most extensive disease will be found to be due generally either to syphilitic deposit, syphilitic sclerosis, or dysentery; and in such cases the calibre of the bowel may be lessened for a space of several inches.

Symptoms.—Where stricture is the result of ulceration, the signs of ulceration will at first mask those of the stricture, and the patient will complain of pain, discharge from the anus, excoriations, and warty growths, together with the failure of the general health, gastric and intestinal disturbance, and wandering pains.

The one sign of a stricture is the obstruction, and this may show itself in several ways, generally at first by alternate attacks of constipation and diarrhœa. The constipation is mechanical, and is due to the accumulation of fæces above the constriction. The diarrhœa is secondary to the accumulation, which in time begins to act as a foreign body, setting up a catarrhal inflammation, as a result of which sufficient fluid is poured into the bowel to soften the hardened mass, and large quantities are discharged, only to be followed by a fresh accumulation.

It has often been asserted that a well-marked lessening of the rectal calibre must, in the nature of things, produce a change in the shape of the fæces, but this is not quite true. The flattened, tape-like stool is a sign of value when present, and should always lead to careful exploration; but it may not be present even in the worst cases of stricture, and it may exist without stricture, in the latter case generally being due to an irregular spasmodic action of the sphincters, or to pressure from without.

the bowel. This point, to which attention was called by White[1] as long ago as 1815, has again recently been made the subject of discussion. In an able article on "Annular Stricture of the Intestine: its Diagnosis and Treatment," in the *British Medical Journal* for May 31st, 1879, Mr. Stephen Mackenzie wrote: "The fact that full-sized, properly formed fæces are occasionally passed, of course shows that there can be no organic stricture." Under criticism, he withdrew the statement in the issue of the same journal for May 15th, 1880, with the explanation that it was founded on his personal observation, which had since been supplemented and corrected by that of others.

In a case which I once saw in consultation with Dr. De Long, of Brooklyn, I had a long-wished-for opportunity to observe, in the presence of a number of physicians, the actual mechanism by which tape-like stools are produced. The woman suffered from a stricture one inch above the anus, which was of sufficient calibre to admit the ends of two fingers easily. She had never noticed any deformity of the fæces. While under the influence of ether, and after the sphincter had been very thoroughly dilated, an O'Beirne tube was passed through the rectum, which was empty, into the sigmoid flexure, which was full. After resting there a few moments it provoked a movement of the bowels. The stricture was instantly crowded down into view, appearing at the anus, and taking the place of the anus, which, owing to the complete dilatation, ceased to have any action and was simply a patulous ring. Through the stricture there came a long, tape-like evacuation, the mould which gave it its peculiar form being the stricture pressed to the surface of the perineum, and greatly lessened in calibre by folds of mucous membrane, which were crowded into it from above. While remarking to those present on the peculiar mechanism of its production, the straining ceased, the stricture rose, the mucous membrane was relaxed, and a passage of natural formation was the result. This alternation was repeated several times. At

[1] "With regard to the lessened diameter of the fæces, just noticed, which must necessarily be the case whenever a permanently contracted state of the gut takes place; yet it has happened, in some instances where that change had been observed, that, in a more advanced period of the disease, fæces of a natural size had occasionally passed. The knowledge of this circumstance I consider of some importance, inasmuch as, if properly attended to, it will prevent the practitioner from hastily concluding there is no stricture merely from an examination of the evacuations, when symptoms may otherwise indicate the presence of the disease."—"Observations on Stricture and other Affections occasioning a Contraction in the Lower Part of the Intestinal Canal," etc., Bath, 1815.

each violent effort the stricture was forced down to the anus, the membrane above it was crowded into it so as to greatly lessen its calibre, and a flat passage was the result. When the effort was less violent, there was still a passage, but the stricture having risen to its place, and not being so tightly filled with the mucous membrane, the passage was natural. The lesson to my own mind was this : that a stricture of large calibre might, as a result of straining, cause a passage of very small size ; and that to get this peculiar shape the stricture must be crowded down so as to actually take the place of the external sphincter, and be the last contracted orifice through which the soft substance is expressed. It is well known that, with the closest stricture high up, the fæces may be reformed in the rectum below and be passed normal in size. At the bedside but little importance is to be attached to the statements of patients concerning this matter.

After a stricture has existed for a certain length of time, signs of obstruction will be manifest by abdominal palpation and inspection. The transverse and descending colon can be felt partially distended with masses of fæces, and will be dull on percussion, tender to the touch, somewhat movable, and pitting on firm pressure. After an attack of diarrhœa, or after a brisk purge, these accumulations may disappear, only to form again in a short time. Generally complete obstruction does not occur without ample warning in this way. It is preceded by eructations of fœtid gas, the abdomen swells and becomes very tender on pressure, the coils of intestine are visible through the abdominal wall, and their visibly violent peristalsis gives proof of the effort nature is making to overcome the obstacle. After a short time the patient is exhausted, and, unless surgical aid is given, dies. Complete obstruction has been seen to occur very suddenly, forming almost the first intimation of serious disease ; and this is more apt to be the case where the stricture is high up in the rectum or at the junction with the sigmoid flexure. It comes on with the usual signs of acute intestinal strangulation—pain, swelling of the abdomen, bloody passages, etc.—and it may be caused by some indigestible substance which has been swallowed and refuses to pass the stricture, or merely by hardened fæces or prolapse of the bowel above into the constriction.

There is one important element in the obstruction due to stricture which must not be forgotten. It will sometimes happen that fatal obstruction will occur even when, on *post-mortem* examination, the calibre of the stricture is found to be large

enough to permit the passage of the finger, showing that the obstruction could not have been due merely to the contraction of the new growth. John Hunter remarked a fact of this sort, as is proved by the following account :

"On introducing the pipe by the anus, it was found to come butt against one side of the upper part of the cavity of the tumor, where there was a bend in the passage ; but why a crooked pipe did not pass when attempted to be passed by turning it to all sides I cannot conceive, or why a bougie which was slightly bent did not hit the hole is not easily accounted for; but, what is more extraordinary than either, why a clyster did not pass freely up ; or why did not the wind or soft excrementitious matter that did yet lay [*sic*] pass readily down, while I could pretty readily pass the end of my finger down from the gut above into the tumor ? The folds of the contracted part did not appear after death to have been sufficient for an entire stoppage of this sort." [1]

Notwithstanding the statement that the folds of the part did not appear *after death* to have been sufficient to produce the stoppage, it seems that a prolapsed fold of mucous membrane is the only thing likely to give rise to it. In cases of advanced disease a spasmodic stricture (if such ever occurs) would seem out of the question, whereas partial or complete invagination in this part is known to be of frequent occurrence. As shown by Rokitansky,[2] the paralysis above the stricture is also an undoubted element in the production of the occlusion.

Diagnosis.—The first means of diagnosis in stricture is the examination with the finger; and, as the great majority of strictures are confined to the lower portion of the rectum, this is in itself generally sufficient. It is the best and safest and least painful of all the means of diagnosis when properly executed, and yet it may be the immediate cause of death to the patient when roughly practised. There is an inborn tendency on the part of many, when the index finger comes in contact with a tight stricture, to bore through the narrow passage which is left and feel what is on the other side—a tendency to be struggled against and overcome. If the surgeon has deliberately determined to practise divulsion, this is one way to do it; but at present we are speaking of diagnosis, and forcible dilatation is not diagnosis, but a very grave surgical procedure. The finger

[1] Hunterian MS. : "Cases and Dissections," No. 59 in "Descriptive Catalogue," etc., vol. iii., p. 98. From Mayo, op. cit., p. 249.

[2] "Manual of Path. Anat.," vol. ii., translated by Sieveking.

should therefore be passed slowly up to the stricture, and, unless the calibre admits of it without straining, it should not be passed further. The condition of the parts below may also be appreciated, the amount of induration estimated, and a general idea formed of the nature and extent of the disease. In women the vaginal touch will generally be found of the greatest value and should never be omitted.

As a rule all can be learned in this way that can be learned in any other where the disease is within reach of the finger, and nothing is to be gained by a painful speculum examination or the use of the bougie—means of diagnosis which, however valuable where the stricture cannot be felt by the finger, are of little use for the lower four inches of the rectum.

When a stricture is situated high up in the rectum or in the sigmoid flexure, the confidence in diagnosis which comes from actual contact of the finger with the disease is entirely lost, and there is perhaps nothing in the whole range of surgical diagnosis which requires more skill than the detection of stricture in this part, and nothing attended with more uncertainty. The symptoms of stricture of the upper part of the rectum are not the same as when the disease is lower down, for the nerve supply is not the same nor is the sphincter muscle involved. For this reason the patient is much more apt to suppose himself suffering from chronic constipation and dyspepsia than from hæmorrhoids. Pain in the abdomen, not always localized at the left side, pain in the loins and down the legs, obstinate constipation and occasional diarrhœa, are the things usually complained of, and in these there is nothing upon which to base a positive diagnosis. The fæces may never present any peculiarity, for the reason that they are accumulated in the rectal pouch below the obstruction and passed in the natural shape. They are apt to be lumpy and unformed rather than misformed, but they may be streaked with blood or slime, which is always a valuable sign and one calling for careful physical exploration.

A stricture in the locality in question must be examined for with the greatest care and gentleness, and the examination will often be negative in its results. The attempt to decide the question by the use of bougies is not always satisfactory and by no means free from danger. It is unsatisfactory to the general practitioner because an obstruction will generally be encountered in trying to pass an instrument of any considerable size through this part of the bowel, and the passage of an instrument of small size, which is much easier, proves nothing. It is dan-

gerous because, with the ordinary rubber rectal bougies, a diseased bowel may easily be ruptured with what may seem to the operator to be no more force than is justified in attempting to overcome the natural obstructions in this part of the passage. The bulbous-pointed bougie on the flexible stem appears *a priori* to be the most suitable for the exploration, but it is much more difficult to pass than the soft-rubber instrument.

O'Beirne gives the following description of the way to pass his tube: "A gum-elastic catheter of the largest size was inserted into the anus, and passed to the height of about two inches up the rectum, where its further progress was felt to be opposed by strong expulsive efforts, which lasted but a few seconds, then relaxed, and again became renewed. By first yielding somewhat to these efforts, and then taking advantage of the succeeding relaxation, the instrument was gradually passed to the height of seven or eight inches. At this point the resistance was sensibly felt to be much greater than at any former, but, instead of allowing it to yield, the instrument was pressed more firmly upward. Having steadily continued this pressure for about one minute, the resistance suddenly gave way, the tube passed upward as if through a narrow ring," etc.

Even with the softest instrument, the moment when the obstruction suddenly gives way and the instrument passes forward will be an anxious one for the surgeon, and the life of the patient may be sacrificed to desire for certainty of diagnosis.

A bougie intended for this purpose should always be hollow, and the opening at the lower end should be of a size to admit the small tube of a Davidson syringe, which should be fitted to it before the attempt to pass it is begun. Then, with a basin of warm water close at hand, the bougie may be introduced, and at the first obstruction the bowel should be filled with water until it is moderately distended. In this way the folds of mucous membrane are drawn out of the way by the distention of the whole bowel, and one great obstacle is eliminated. The next is the promontory of the sacrum, which is much more easily passed by a soft than by a stiff instrument. Without these precautions, and sometimes with them, the inexperienced examiner will find a stricture in the rectum of nineteen persons out of twenty, no matter how healthy they may be; and for this reason it is seldom safe to rest the diagnosis of stricture on the fact that a bougie cannot be made to pass. Moreover, a bougie of good size will often pass a stricture small enough to produce great trouble.

In certain cases information may be gained by the use of a long, cylindrical speculum, with the patient bending over the table or chair and straining down to bring the parts into view. But the best method in a doubtful case is a careful bimanual examination under ether. Passing the whole hand into the rectal pouch, and then the finger into the sigmoid flexure as far as possible, is by no means free from danger; still, with a small hand the diagnosis may be rendered certain for all that part of the bowel at present under consideration. I know of no other way than this by which a stricture in the sigmoid flexure, which cannot be felt by external manipulation, can certainly be recognized, except exploratory laparotomy.

Treatment.—The treatment of stricture of the rectum is both constitutional and local, medicinal and operative. The first question to be answered is as to the advisability of antisyphilitic medication. In recent cases where syphilis is to be suspected this should never be omitted.

It is well to exercise caution in this matter, however, and the cases in which the patient should be submitted to this form of treatment should be carefully chosen. The practitioner who considers the majority of strictures as syphilitic, and indiscriminately uses mercury and iodide of potash, will be mistaken about as often as he who looks upon most of his cases as cancerous and therefore incurable. The general condition of a patient with a stricture is never up to the normal, and an unnecessary course of medication may do great harm instead of good.

Cicatricial tissue, though the result of specific disease, is beyond the reach of specific treatment, but, where the case can be seen early enough, much improvement can be gained by a thorough course of mixed treatment, and a gummatous deposit or a syphilitic sclerosis may be checked. Mercury and iodide of potash should both be given, neither being relied upon alone. Mercury in the form of an ointment or the oleate may also be administered by the rectum, and the full constitutional effects of the drug may be gained in a very short time by this method; it is, however, an irritating application, and in cases of much ulceration and sensitiveness it may not be well borne.

M. Trelat[1] has seen good effects follow internal medication in cases of ano-rectal syphiloma, though Fournier speaks so positively as to their uselessness. He gives two cases in which the disease was of long standing, but yielded to a considerable

[1] Le Progrès Méd., June 22d, 1878.

degree to the use of mercury and iodide of potash internally, with glycerine applied locally. Van Buren[1] has also seen good effects in a case of this kind from the use of the modified Zittman's decoction, in mild doses, guarded by bismuth, combined with inunctions of the oleate of mercury.

There are various means by which the comfort of these sufferers may be greatly increased without recourse to operative treatment; and since in many cases the surgeon is limited to these means in his efforts to afford relief, it is well that they should receive careful attention. The most effectual of them will be found to be a careful regulation of the diet, the administration of laxatives on occasion, and rest. The diet should consist mostly of fluids, preferably milk. If milk is complained of, soups may be substituted. A certain amount of farinaceous food may also be allowed, such as toast, crackers, and mush; but milk is the basis of the diet, and the other things are only intended to make that diet endurable. Many patients will assert from the outset that they cannot take milk, but nearly all can take it, and considerable quantities of it daily for an indefinite period, if a little care is exercised in its administration.

The bowels should move daily without straining. Should any medication be necessary to secure this daily evacuation, a mild laxative will be found all-sufficient. The mineral waters, or Rochelle or Glauber's salts, answer every purpose. One of the most grateful ways to these sufferers of moving the bowels is to administer an enema of warm water through a long tube which will reach above the stricture. Purgatives are always contra-indicated in stricture of any variety, because they cause straining and tenesmus, increase the tendency to congestion and its consequences, and because where obstruction actually exists or is threatened they may do great harm by exciting violent peristaltic action in an already weakened and ulcerated bowel. The opposite condition of diarrhœa is more difficult to meet and often cannot be controlled by direct medical treatment, depending, as it does, on the ulceration associated with the stricture. It is best met by diet, rest in the recumbent posture, and bismuth with morphine.

The general strength of these patients is to be supported in every possible way, and in all of them where it can be borne cod-liver oil will be found to answer a good purpose.

When obstruction actually exists, much may be done in the

[1] "On Phantom Stricture," etc., The American Journal of the Medical Sciences, October, 1879.

way of general treatment before resorting to operation. Food by the mouth should be almost absolutely suspended; opium should be given in large doses to allay the peristaltic action of the intestine, and large poultices covering the abdomen will be found to give great relief to the suffering. Dr. Norman Kerr has derived great benefit from the administration of the extract of belladonna in doses of one or two grains at short intervals, in this condition, but the *rationale* of its operation is not understood. No purgatives should be administered.

By these means, combined possibly with gentle dilatation, the life of a patient may be prolonged in comfort. I have often been agreeably surprised at the happy results of such measures, where operative interference was either declined or contra-indicated, and they can never be dispensed with though an operation be performed.

The various surgical procedures at our command for overcoming stricture of the rectum may be considered in the following order: 1. Dilatation. 2. Division. 3. Colotomy.

Dilatation.—This may be either gradual or sudden, partial or complete. The use of bougies for gradual dilatation is an example of a good practice originating in false ideas. It was first adopted with the idea of destroying the stricture by the effect of medicinal substances applied in this way; experience, however, soon proved that simple bougies were not less efficacious than medicated ones, and the improvement was then supposed to be due merely to the mechanical stretching of the part, and the instruments were introduced as often and allowed to remain in as long as possible—an idea still very popular. But as Syme[1] pointed out, "it is the effusion of organizable matter in the cellular texture of the part which causes the stricture, and it is the absorption of this deposit which removes the disease. The bougie, by its pressure, excites the action of absorption; and if the pressure be too great, too long continued, or too frequently repeated, there will be a great risk of causing more than sufficient irritation for the purpose, and of inducing again the very condition it is desired to counteract, the consequences of which must be a confirmation and increase of the disease."

The rules which should guide the surgeon in this method of treatment are now well understood and generally admitted. The dilatation should be intermittent and not constant. Attempts at constant dilatation by means of a bougie of any sort which shall remain permanently in place, generally result either

[1] Op. cit., p. 120.

in failure or actual disaster. They are not well borne by the patient, and when their use is persisted in, in spite of the protest which nature is pretty sure to make, the rectum becomes irritable, the suffering is greatly increased, and the patient is exposed to the risk of peritonitis and cellulitis.

The dilatation should never be forced. A bougie should be chosen which will readily pass the obstruction without stretching; and if there be any doubt in the operator's mind as to the proper size of the instrument to be used, let one be selected which is too small rather than too large.

Such an instrument may be left in for three or four hours each day, or, as is a favorite practice with me, may be put in when the patient goes to bed, and left in all night.

Practised in this way, much good may be done by this treatment. The patient may be greatly relieved and made very comfortable; but it must be continued indefinitely. For this reason, I suppose, it is not infrequently used under false pretences in cases of hypothetical stricture in hypochondriacal patients; and most of the reported cases of cure will be found reported by the laity. It has happened to me more than once not to be able to find any stricture after a patient had submitted to a long course of supposed dilatation, and there is but one way of convincing the patient under such circumstances. It consists simply in passing a full-sized instrument its whole length into the bowel.

In cases where the stricture is associated with much ulceration, this, too, must be treated by suitable applications while the dilatation is continued.

The treatment by gradual dilatation alone has to a certain extent been superseded by more radical measures. It is not long since a well-written article on rectotomy in one of our periodicals was begun by the statement that the treatment of stricture by dilatation was acknowledged to be a failure. This is by no means the case. The measure may not be curative, but it is, perhaps, as valuable a palliative as is at the command of the surgeon. It is applicable to all strictures, malignant or benign, which are within reach of the anus. When the disease is high up it is not free from danger, and can scarcely be recommended, on account of the uncertainty and difficulty of its application.

I have said that this treatment by gradual dilatation was not curative and must be continued indefinitely. I have seen no exceptions to this rule, though many of them are reported.

In years gone by, this treatment and that of forcible dilatation or divulsion were about the only means of dealing with this affection. Now we have better ones, which will shortly be described.

Divulsion.—The dilatation, instead of being gradual, may be sudden and complete. For this purpose various instruments have been invented, all of them with the idea of tearing open the constriction by the use of a considerable amount of force.

There are now several cases on record where forcible stretching with the fingers, either with or without previous nicking with a knife, has been followed by immediate relief to obstruction and fæcal accumulation.'

What may be accomplished by this method is well shown in the following successful case from Smith:[2] "I was called by Dr. Vine to see a military officer, aged forty, who had returned from India in the most miserable plight. He had suffered for several years from chronic diarrhœa, and had not got relief from any measures, and six months previously he had been recommended by a medical board to go by sea to England. On his arrival at Southampton, on his way to Edinburgh, his native town, he was so ill that he determined to stop in London; and when he arrived there he sent for Dr. Vine, who, on hearing his history, at once suspected something wrong with his rectum, and, making an examination, found an obstruction. I was requested to see him, and I found the patient exactly in the condition of one suffering from strangulated hernia; he was constantly vomiting, complaining of pain, and the countenance was anxious, and he was much emaciated; the abdomen was immensely distended, and it was clear that, if some relief were not soon given, this gentleman would die.

"In conjunction with Dr. Vine I made a most careful examination, and I found, on introducing the finger into the bowel as far as possible, that it met with an obstruction, but after some time I discovered what appeared to be the opening of the stricture, more like a dimple than aught else. I was enabled to introduce through this a No. 10 gum-elastic catheter, and through this instrument some fæcal matter and air came. I was thus made to see that I had got beyond the stricture.

"On the following day the patient was placed under chloroform, and I guided a long, straight, probe-pointed knife very

[1] Smith, op. cit. Dr. J. M. Matthews, of Louisville, Ky., has recorded one remarkably successful case of this kind.

[2] "Surgery of the Rectum."

carefully along the side of my left index finger, and fortunately got its point into the orifice of the stricture. I nicked this on either side, and then got the point of my finger into the obstruction and dilated the orifice as much as I could, whereupon an enormous quantity of fæcal matter was emitted, deluging the bed and placing myself and my assistants in a most unenviable position. The abdomen became quite flat, and the patient became at once immediately relieved. No bad results followed this operation; in three days we commenced dilatation by bougies, and I was soon enabled to pass a full-sized rectum-bougie through the stricture. In a fortnight I took my leave of the patient, recommending Dr. Vine to pass the bougie daily. I heard a few weeks afterward that the patient had gone to Edinburgh convalescent and able to introduce the bougie for himself."

In spite of a few such successful cases as the one above, this method of treatment has but few upholders, because it has been found to possess no advantages over more gradual dilatation, and to be in itself by no means devoid of danger. The dangers are hæmorrhage, laceration and rupture of the bowel, peritonitis, and abscess. The relief obtained is not permanent, and the operation involves the subsequent use of gradual dilatation to preserve the calibre gained. Even when applied to the lower three inches of the bowel, the operation is rough, uncertain, and unsurgical, and above this point it is scarcely admissible. Nevertheless it has occasionally served a good purpose, and a few happy results are recorded in cases of linear contraction.

Division of the Stricture.—The practice of nicking a linear stricture in two or three places as a first step in the treatment by dilatation is a good one and generally devoid of danger. It can usually be done entirely by the sense of touch, with a straight, blunt-pointed bistoury passed along the left index finger as a guide.

The operation of internal proctotomy consists in dividing the whole of the stricture tissue in the median line either anteriorly or posteriorly. It is called internal because the incision is confined within the rectum and does not involve the sphincter, and it is generally performed with the knife in preference to the cautery or *écraseur*.

Regarding this operation there is not very much to be said. It involves no new principle of treatment, and would seem to rank rather with the older procedures, such as nicking and dilatation, than as a substitute for colotomy. There have been many unpublished cases, especially in New York, and I should

probably express the general feeling of the profession were I to say that it is not looked upon with very great favor. Though at first sight it might appear less serious than the external operation, it is the more dangerous of the two—the sphincter preventing the free discharge from the wound and increasing in this way the liability to pelvic inflammation. The danger of hæmorrhage is not very great when the incision is confined to the median line, but, should there be trouble from this cause, the advantage of a free external wound in controlling it will at once be manifest. When the cut is anterior as well as posterior, the anatomical relations must be borne in mind, lest the peritoneum in the female, or the bladder in the male, be wounded.

External proctotomy involves not only the division of the stricture, but of all the parts below, including the anus. This is the operation usually accredited to Nélaton, and more recently advocated by Verneuil, Panas, and others. It may be performed in several ways, and with the knife, galvano-cautery, or *écraseur*. The operations with the galvano-cautery and *écraseur* were invented by Verneuil,[1] and have been practised by him more than by any other surgeon.

The operation, as performed by him, consists in passing the left index finger through the stricture as a guide, and then plunging a trocar from a point in the median line, just in front of the tip of the coccyx, into the rectum, on to the tip of the finger above the stricture. After drawing out the trocar a fine bougie is passed through the canula into the rectum and brought out at the anus. Removing the canula, the bougie is replaced by the chain of the *écraseur*, and the operation is completed.

The same section may be accomplished by repeated strokes of the galvano-cautery or thermo-cautery knife. Both these measures are intended simply to prevent hæmorrhage, and have no other advantage over the knife, and by any of the methods all of the stricture tissue and the parts below may be divided.

Nélaton's method was the simplest of all, and was to introduce the left index finger as far as the stricture, and, with this

[1] Verneuil: "Des rétrécissements de la partie inférieure du rectum, et de leur traitement curatif ou palliatif par la rectotomie linéaire, ou section longitudinale de l'intestin à l'aide de l'écraseur," Gaz. des Hôp., October 26th, 29th; November 7th, 9th, 12th, 16th, 19th, 1872. "Traitement palliatif du cancer du rectum au moyen de la rectotomie linéaire," Gaz. Hebdom., March 27th, 1874.

as a guide, to pass in a blunt bistoury and divide all the soft parts below the stricture as nearly as possible in the median line. By pulling open the lips of this incision, the stricture comes plainly into view and may be divided by a second incision.

For this purpose I employ the knife shown in Fig. 122. It is simply the lithotomy knife of Blizard, made heavier in the back and at the handle; for with an ordinary bistoury there is great risk of breaking the blade in the midst of the stricture tissue, which is often as hard as cartilage, and thus having an awkward accident. The blunt point on the end of the blade is a great convenience in passing the knife along the index finger, avoiding, as it does, all risk of wounding the operator.

The best position for the patient is the lithotomy position, and the whole incision may be made at one stroke. The blade should be passed fairly through the stricture before the cutting is begun, then the stricture is divided completely, as near as possible in the median line posteriorly, and finally the incision is

Fig. 122.—Proctotomy Knife.

continued downward and outward, growing deeper as it approaches the perineum, till all the soft parts are severed between the anus and the tip of the coccyx. In this way a large triangular wound is made, the apex being within the rectum, above the stricture, and the base at the skin, and all the stricture tissue is completely cut through.

There will generally be a free gush of blood when the cut is made, and the rectum should at once be packed in the manner already described, without waiting to try any other method of stopping the bleeding. This is a precaution which should never be omitted.

It is this hæmorrhage, and the trouble of removing the lint with which it is almost always necessary to stuff the rectum, which has led some to operate with the thermo-cautery. The bleeding is absolutely nothing, and the wound is dressed by its own eschar, thus saving much distress to the patient.

It may be asked, Why should so large an incision be made, and so much tissue be divided below the actual disease? The answer is simple. In the first place, this incision provides for free

drainage and discharge in the most effectual of all ways, by furnishing a dependent gutter-shaped opening which cannot become closed. This is better than any number of drainage tubes, and it is this alone which makes the external operation a safer one than the apparently slighter internal incision.

In the second place, by this incision the sphincter is completely divided and another great point is gained. The operation we are now considering, it should be remembered, is nothing less than a substitute for colotomy in the same class of severe cases for which that operation is generally considered the only relief. One point which is exceedingly well brought out by a study of these cases is the important part played by the sphincter muscle in the sufferings accompanying severe cases of stricture and ulceration, and the relief which may be obtained by its simple division without interference with the stricture itself.

In one case of Verneuil's, for example, there was a stricture high up, and yet, under a mistaken diagnosis of spasmodic stricture at the anus, the sphincter was cut through with the galvanocautery, while the real cause of the trouble was untouched, and yet there was entire relief from suffering. The same experience has been repeated often enough to establish the general principle that free division of the sphincter is not only a justifiable therapeutic measure for the relief of the pain attendant upon either benign or malignant stricture or ulceration, but is often the best means at the surgeon's command for allaying suffering.

By the external operation, then, the obstruction is divided, and one great cause of suffering is abolished, and both are effected by the same stroke of the knife.

The after-treatment of the incision is very simple. When the rectum has been tightly packed with picked lint, it will usually cause more or less uneasiness on the following day, unless the patient be under the influence of opium. For this reason I generally remove enough of it on the following day to give the patient ease, and the remainder is allowed to remain until suppuration has commenced. It may usually all be picked out by the third or fourth day without causing any pain. The subsequent treatment of the incision itself consists wholly in cleanliness, which may be obtained by gently syringing the part with warm water and a little carbolic acid. No particular attention need be given to regulating the passages. The first one after the operation will often be the only comfortable one the patient has experienced for years, and, unless there is some special reason for interference, they may be left entirely to nature.

At the suggestion of Weir I have come to adopt a modified operation in these cases. Internal proctotomy exposes to great danger of periproctitis, and external proctotomy involves prolonged convalescence from delay in closure of the external incision through the sphincter—a delay sometimes of months. Weir's idea was, after an internal division, to run a drainage tube from the bottom of the cut out at the tip of the coccyx, to leave it in for three or four days till the danger of periproctitis had passed, and then to remove it. I have done this in several cases with good result, and it is the method I now prefer.

Regarding the operation of proctotomy from every standpoint, I have been somewhat disappointed in it. I have never seen in my own practice any of the perfect cures reported by its advocates in France. True, it greatly shortens the treatment by dilatation, and it gives immediate relief to obstruction, but it is not curative and is only preparatory to the subsequent continuous use of the bougie. In malignant disease, as a substitute for colotomy, I have abandoned it, having had two fatal cases. In non-malignant strictures of the less severe form I always employ it, and follow it after a few weeks with systematic dilatation with the short bougie, left in several hours. Although I cannot say I have ever seen the induration of a stricture entirely disappear, I have by these means, combined with topical applications to the ulcerated surface and the prolonged administration of the tincture of arbor vitæ, made several of my cases so comfortable that they no longer consider themselves as uncured and have abandoned all treatment. Indeed, my success has been something of a surprise to myself, and has led me to give a much more favorable prognosis in these cases than I did in the early years of practice.

Excision.—The operation of excision, which is generally applied only to cancerous strictures, and which will be fully described under that head, has also been applied to simple strictures. I have done it in a few cases and have been satisfied with the results.

There is but one other means of dealing with non-malignant stricture—*colotomy*. In the ordinary run of cases this will not be necessary, but in some of the more severe forms, those attended by much ulceration, fistulæ, etc., where the patient's strength is gradually giving way under the pain and loss of sleep caused by the frequent movements of the bowels, this is the proper line of treatment. After colotomy some of these cases will heal, and the artificial anus may be closed by opera-

tion. I have some cases, now in very fair health, who were very near the point of death when this operation was performed.

In stricture involving the anus only, and extending not more than five cm. into the rectum, the following operation is recommended by Esmarch:[1]

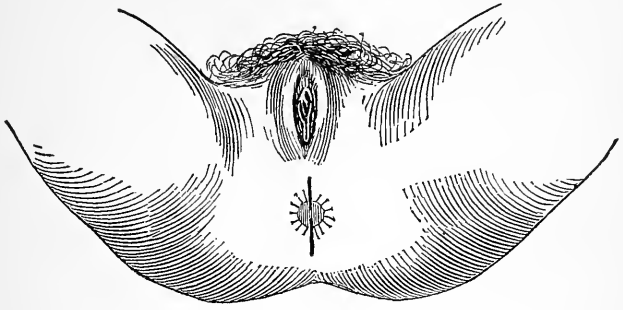

Fig. 123.—(Esmarch.)

The anus is divided in the median line front and back, as shown in Fig. 123.

The mucous membrane is dissected up in front and behind

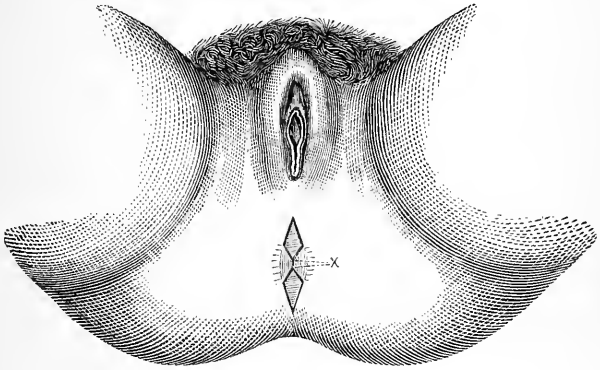

Fig. 124.—(Esmarch.)

until it can be drawn into the outer angle of the skin incision, as shown in Fig. 124. The mucous membrane is then sutured to the free edges of the skin incision, with the result shown in Fig. 125.

This operation is particularly adapted to strictures of slight

[1] L. c., p. 124.

extent due to contraction of the skin of the anus—such as might be caused by burns or by too free removal of skin in the operations for hæmorrhoids. It is successful in that it draws down healthy mucous membrane to take the place of cicatricial tissue.

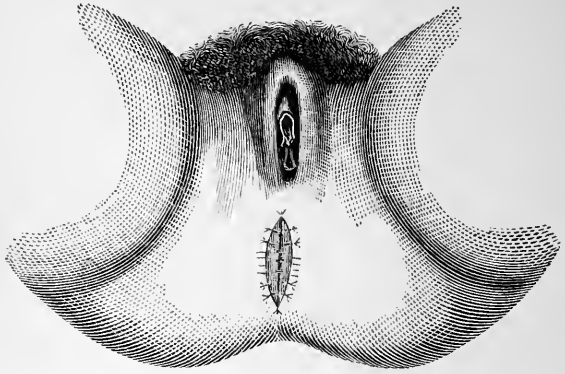

Fig. 125.—(Esmarch.)

In another class of cases the injury to the lower part of the rectum may have been so extensive that to dissect up and draw down sufficient mucous membrane to transplant into the anus

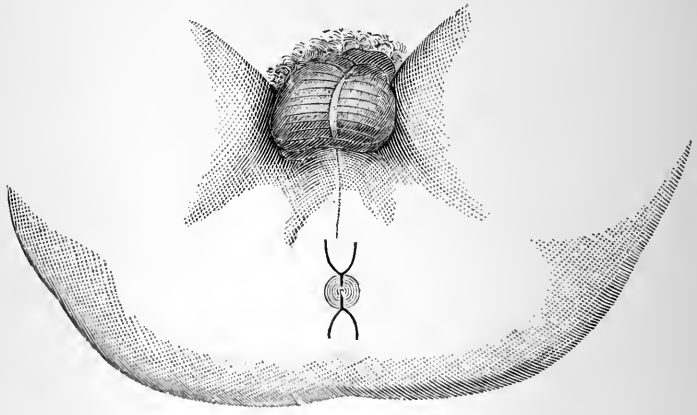

Fig. 126.—(Esmarch.)

would be attended by danger. These are cases in which more or less extensive periproctitis has resulted in contraction. In them the skin around the anus must be drawn into the orifice to

supplement the mucous membrane, instead of *vice versa*, and for this Dieffenbach has recommended the following operation :

An incision is made front and back, as in the former case, but extending only as far outward as the margin of the anus.

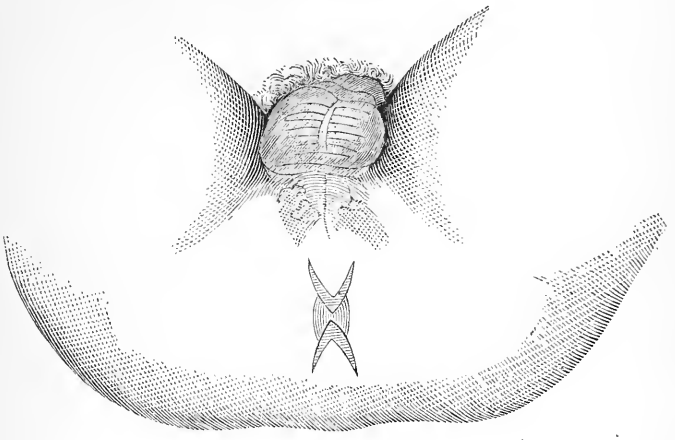

Fig. 127.—(Esmarch.)

(Fig. 126), and this is joined by a semilunar incision anteriorly and posteriorly, as shown in Fig. 126.

The flaps of skin included in the semilunar incisions are next

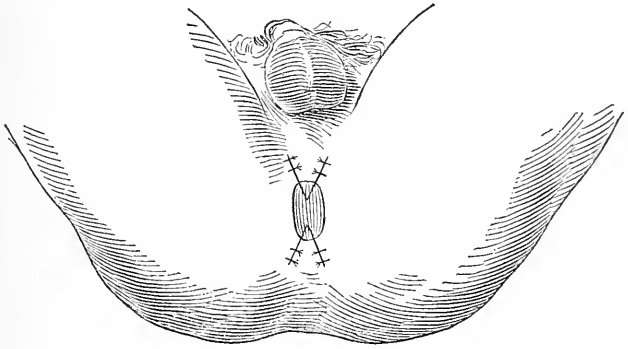

Fig. 128.—(Esmarch.)

carefully dissected up from the cellular tissue, as shown in Fig. 127, drawn into the anal incision, and sutured, as in Fig. 128.

Within the last few years a new method of treating stricture of the rectum has come in vogue—that by electrolysis—and it

may be worth while to add my testimony to that of others regarding it. I have tried it extensively, and, I believe, according to the most approved methods. As far as *absorption* of the stricture goes, I have found it a delusion and utterly valueless. By a combination of dilatation and cautery action I have known it to do good, but with either the ordinary bougie or a knife I can do much better.

CHAPTER XIII.

CANCER.

In a general way it is undoubtedly true that new growths in the rectum, when benign, increase slowly, tend to grow away from the wall of the bowel, to form pedicles for themselves and to project into the calibre of the canal, to remain movable, and not to involve surrounding parts; while with cancerous formations the tendency is just the opposite. In this way the diagnosis between a benign polyp and a cancerous infiltration of the wall of the rectum is generally easy.

But there is a class of tumors which occupies the border line between the benign and the malignant, in which the diagnosis, either clinically or with the microscope, may be difficult and even impossible. In fact, recent careful study of these rectal tumors goes far to break down the lines between the varieties which are usually drawn; and Cripps,[1] who has done such careful and valuable work in this department, is inclined to group nearly all of them under the single head of adenoma, holding that all are primarily affections of the glandular element. The true nature of the growths may perhaps best be gleaned from a comparison of Fig. 129 with Fig. 107, the latter being a benign polypus, and the former a malignant growth, but both being adenomata.

According to Cripps, the names malignant, semi-malignant, and simple adenoid will cover both the benign and cancerous growths of this part of the body, except possibly the form of colloid. Generally, but not always, it is possible to distinguish between them both clinically and microscopically.

After speaking of the innocent growth, which is soft, has a fairly marked pedicle, and projects into the cavity of the bowel, he says: "In the more malignant varieties, the new growth frequently spreads as a thin layer between the muscular and mucous coats. In this form it often occupies several square inches of the bowel, while its thickness does not exceed a quarter of an

[1] "Cancer of the Rectum," 1889.

inch. At first the mucous membrane lies intact over such a layer, but eventually it gives way by ulceration. This ulceration sometimes begins at more than one point, so that the mucous membrane becomes honeycombed, and portions of the subjacent growth may even sprout through it. The destructive process not only destroys the mucous membrane over the surface of the growth, but after a while the new growth is itself destroyed by ulceration. While destruction is proceeding toward the centre, the growth is advancing toward the circumference. In this way a crater-like mass of disease is produced, the centre of which consists of dense fibrous tissue belonging to the muscular coat of the bowel, which appears for long to resist the ulcerative process. The margin of the crater consists of the mucous membrane of the bowel, heaped up by the extending growth beneath it, tucking it over in such a manner as to overlap the healthy

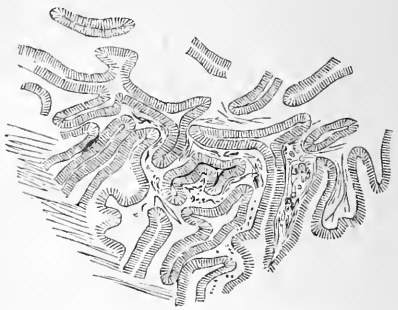

FIG. 129.—Cancer of the Rectum—Malignant Adenoma. (Stimson.)

membrane. The border is at times so irregular as to represent a series of nodules rather than a continuous line."

Stimson[1] has also made a careful study of these growths. He says: "If it is admitted that cancer of the rectum is essentially a glandular or epithelial affection, one having its origin in the mucous membrane, the borders of the growth, as being the freshest, most recent portions, must be examined, as in carcinoma of other organs, for evidences of primary changes and mode of development. These changes consist of hypertrophy of the mucosa by hypertrophy and hyperplasia of its epithelial elements, together with an abundant development of embryonal connective tissue between the tubules. They are the same as those found in a variety of neoplasm of recognized benign cha-

[1] "A Contribution to the Study of Cancer of the Rectum," Archives of Medicine, August, 1879.

racter known as polyp of the rectum or polypoid adenoma. The formation of a pedunculated growth with a tendency to isolation in the one case, and of a flat growth with a tendency to spread laterally and into the underlying tissue in the other, may be explained partly by mechanical causes and partly by the degree of intensity of the changes in the submucous connective tissue. If the primary change occupies a limited area upon a natural fold of the mucous membrane, and if the muscularis mucosæ remains unbroken until the young embryonal cells produced below it, in consequence of the neighboring irritation, have had time to develop into adult fibrous tissue, the natural retraction of this new tissue narrows the base of the fold, giving it at once a polypoid form and opposing by its greater density a stronger barrier to the extension of the epithelial formation in this direction. The pedicle once formed, the neoplasm increases in the direction open to it, that is, into the lumen of the canal in all its diameters, and the dragging to which it is subjected by the constantly recurring passage of the fæces lengthens its pedicle and tends toward its final separation.

"On the other hand, if a broader area is occupied by the primary change, or if the processes are more intense and rapid, the pedunculation is absent or less perfect, and the epithelial growths of the mucosa break through immediately, or after an interval spent in overcoming the greater resistance offered by the partial pedunculation, into the submucous tissue. Once established in that region, the spread of the disease is easy and its ultimate generalization a question only of time.

"The second and final barrier to generalization is presented by the muscular coat of the intestine, but it is a barrier in which are many gaps, large ones along the lines of the vessels, and innumerable small ones in the fine meshes of connective tissue which separate the muscular bundles and are continuous with the submucous tissue on one side and the pararectal tissue on the other. Here, too, the intensity of the process materially affects the rapidity of its extension; for if the proliferating connective tissue, which is most easily implicated while it is in the formative stage, is allowed time to reach its full development, to become fibrous, it forms, as it were, a second line of defence capable of offering a certain resistance after the first line has been carried."

With a full appreciation of the importance of the conclusions which Cripps has reached, it may still be well, in a work of this kind, to call attention to some of the clinical characters of some

of the different forms of malignant disease as found in this part of the body.

Of all the varieties of true cancer, the one most frequently met with is *epithelioma*, and this presents itself, here as elsewhere in the body, under two forms distinguishable with the microscope and clinically. The first (cancroid, lobulated epithelioma) contains the characteristic onion-like nests of squamous epithelium, and is the same form so commonly seen in the lip, though rarely about the anus. It has its point of origin at the anus, and not within the rectum, and begins as a hard, dry, warty nodule. It is slow in progress, covered at first with firm epidermis, and only begins to ulcerate late in its course. It seldom spreads far up the rectum, but tends rather to involve the integument, which it may destroy to an extent similar to that sometimes seen in the same variety of disease about the face. This form of disease is rare. In the other variety (cylindrical epithelioma) the cells are columnar, and the growth resembles in minute structure the mucous membrane from which it springs. This variety, on the contrary, chooses the rectum proper for its development, and is found above the internal sphincter. It is easily distinguished from the former, but not so easily from a scirrhus which has begun to ulcerate. It is softer than the other, more vascular, and therefore more prone to bleed and undergo extensive degeneration and ulceration, and it rapidly infiltrates surrounding tissues. Early in its course it is movable on the subjacent tissues, but it is seldom seen by the surgeon at this stage. At a later period it presents itself as a soft, friable mass seated on a hard, infiltrated base ; ulcerated in spots, the edges of the ulcers being hard and raised. At this stage the growth will yield on pressure the well-known cancer juice containing cells and nuclei, and it may be difficult to distinguish it from a tumor which began in the submucous tissue as a hard mass and subsequently underwent degeneration.

Next to epithelioma, *scirrhus*, or hard cancer, is the variety most frequently met with in the rectum. It arises, not, like epithelioma, in the mucous membrane, but in the submucous connective tissue ; therefore, in the early stages of its growth the membrane is found normal and movable over the hard mass beneath. When cut into it shows the characteristic raw-potato-like hardness of scirrhus, and there is no distinct line of demarcation between it and the adjacent tissues. From the original tumor are often seen, and sometimes felt, hard fibrous bands spreading out in various directions, generally longitudinally in

the bowel—the processes or claws from which cancer takes its name. These tumors may soften down in parts and slough or ulcerate away. When ulceration has begun, a cavity with an irregular outline is formed in the midst of the hard cancer tissue, from which issues a fœtid discharge mixed with more or less blood and pus. Although a large part of the growth may die in this way and be discharged, the steady increase in the disease is not checked. Indeed, the growth often seems to be most rapid in the bed of the part which has been destroyed.

This form of cancer is said to be most apt to show itself first on the anterior wall of the rectum, near the prostate,[1] and "to increase most on the side of the chief arterial supply, and in that toward which, by lymphatics and veins, its constituent fluids most easily filter."[2] It spreads by infiltrating all the adjacent parts, eventually involving all the coats of the bowel, and extending both in surface and thickness till, instead of appearing as a hard, movable spot under the mucous membrane, it involves a great part or the whole of the circumference of the rectum, enclosing it in a dense, contracting sheath. The hardness and contractility of this form of disease are the chief clinical facts upon which a diagnosis rests ; and yet, leaving out of consideration the history of the case, it will often be impossible to distinguish between the gross appearances of scirrhus and those of simple fibrous stricture.

Encephaloid has its primary seat in the glandular tissue of the mucous membrane. It is enclosed in a capsule of connective tissue, from the internal surface of which spring trabeculæ which divide the mass into lobules. On section it may be comparatively firm or nearly fluid, and almost white or stained red with blood. It is often very vascular ; large vessels may sometimes be seen on its surface, and large blood extravasations may be found in its interior. The name fungus hæmatodes has been applied to a variety of this disease in which, after the capsule has burst, the mass has protruded. The material composing it may resemble brain tissue (from which it is named), or it may be more spongy and shreddy, like placenta. On squeezing a section of the tumor a large amount of juice may be obtained, and this, when thrown into a vessel of water, is uniformly diffused through it, giving it a milky hue. This is given by Paget as an exceedingly valuable rough test of the nature of the growth. These cancers are rapid in their increase, and may

[1] Allingham, Mollière.

[2] Moore. See "Bryant's Surgery."

attain an immense size, fairly filling the pelvis. They quickly affect the neighboring lymphatics, and, when enucleated, speedily recur. The results of removal are, however, particularly favorable for a short time, as shown by the immediate improvement in the general condition of the patient and the disappearance of the cancerous cachexia. The extreme softness of the tumor, and the deceptive sense of fluctuation imparted to the finger, may cause a mistake in diagnosis, which may be avoided by the use of the aspirator, or even the hypodermic syringe. When the fluid thus obtained is examined under the microscope, it will be found to contain cells and nuclei, with more or less blood.

In *colloid* cancer (alveolar cancer) the structure is essentially the same as in the last variety, except that the alveolar meshes are filled with a jelly-like material, which in its most natural state is glistening, translucent, and pale yellow. This variety of cancer has its origin in the follicles of Lieberkühn, or the crypts which surround the rectum. It is not very rare in this part, and appears in the shape of large, lobulated, fungus-like tumors, which are soft and easily broken down. Under the microscope the mucous contents of the alveoli will be seen to contain cells of various forms, the most characteristic being large, round, and flat, with a nucleus and concentric laminæ. The growth rapidly infiltrates the surrounding tissues, and secondary deposits will often be found in the neighborhood of the original mass, the whole tending to undergo cystic degeneration. The malignancy of these tumors varies in degree, some of them being comparatively benign ; they do not always recur after removal, nor do they readily infect the lymphatics and viscera, being in this respect about on a par with epithelioma. The term colloid is used without much exactness, being applied to almost any growth which consists in part of large, cellular spaces filled with glue-like material.

Cruveilhier draws this distinction between colloid and encephaloid. The colloid degeneration is not susceptible, as is the encephaloid, of inflammatory action producing gangrene; moreover, if the sanguineous centres are not absolutely foreign to it, it is certain that they are incomparably rarer in colloid than in the cancerous degeneration, properly so-called, where effusions of blood are so often met with—apoplectic centres sometimes so large as to conceal the true nature of the morbid tissue.

Colloid alveolar degeneration shows only one mode of destruction—by encroachment in successive layers; this encroach-

ment, sometimes rapid when it occurs in the alimentary canal, permits of the re-establishment of the flow of fæces, temporarily interrupted by the undefined and often very rapid increase in the degenerated parts; so that to the gravest signs of fæcal retention there sometimes succeeds a more or less rapid separation, with and without diarrhœa.[1]

Melanotic carcinoma, or black cancer, is by some classed among the true cancers, and by others among the sarcomata. It belongs to the class of soft or medullary cancers, and its distinguishing feature is the development of pigment. Whatever may be said of the microscopic characters of melanoma, it is clinically a very malignant growth, running a very rapid course, and very likely to become generalized. Its clinical history, as relates to the rectum, is to be studied from eleven cases only, ten of which have been given in full in an exhaustive study by Nepveu, read before the Société de Chirurgie (1880).[2] The cases are reported by the following observers: Schilling,[3] Kopp,[4] Moore,[5] Maier,[6] Virchow,[7] Ashton,[8] Gross,[9] Meunier,[10] Gussenbauer,[11] Nepveu,[12] and Ball.[13]

From the seven of these cases which are reported with an approach to completeness, several facts of interest are to be gathered. The age of all of the patients was advanced, ranging between forty-five and sixty-four years. Five were in men, two only in women. In the microscopic examinations which were made in five of the cases, the tumor is in every case described as a sarcoma. There is nothing in the symptomatology to distinguish this form of disease from others, except that in one case the stools were colored black from mixture with the pig-

[1] Cruveilhier: "Traité d'Anatomie Path. Gén.," t. v., p. 69.

[2] "Mémoires de Chirurgie," Paris, 1880.

[3] Mentioned by Eiselt, obs. v., Prag. Viertelj., bd. 70 u. 76.

[4] "Denkwürdigkeiten in der ärztlichen Praxis," bd. iv., Frankfort, 1838, pp. 305–313.

[5] Medical Times, March, 1857.

[6] Berichte über die Verhandlungen der Naturforschenden Gesellschaft zu Freiburg, 1858, No. 30, p. 516.

[7] "Pathologie des Tumeurs," Paris, 1867, t. ii., p. 281, note.

[8] Ashton, T. J.: "Prolapsus, Fistula in Ano, etc.," 3d edition, London, 1870, p. 162.

[9] "System of Surgery," Philadelphia, 1872, vol. ii., p. 589.

[10] Bull. de la Soc. Anat. de Paris, 1875, p. 792.

[11] "Ueber die Pigmentbildung in melanotischen Sarcomen und einfachen Melanomen der Haut," Virchow's Arch. f. path. Anat. u. Phys., lxiii., 1875.

[12] Op. cit.

[13] Brit. Med. Journ., October 12th, 1885.

ment—a point which might aid in diagnosis were the tumor so high up as to be out of sight. In rectal examinations it was also noticed that the finger was colored in the same way. The location of the disease was once in the sigmoid flexure, three times in the rectum above the sphincter, and four times at the anus. The size of the growth was generally considerable, surrounding the bowel and projecting into its cavity. Sometimes it was firm enough to cause tight stricture, at others ulcerated and broken down in parts. The course of the disease is marked by secondary deposits in the adjacent glands or in the viscera, while the original growth may spread in neighboring organs, and by ulceration cause a foul discharge mixed with blood and pigment. To these may be added the usual signs of incontinence and obstruction. The duration of the disease in no case exceeded three years, but it was generally fatal in a much shorter time. The diagnosis is easy if the growth can be seen, and it is sometimes assisted by the secondary black deposits. In five cases the tumor was removed, but the return was not long delayed. This form of cancer, though rare in man, is said to be relatively much more frequent in the horse.

Most malignant growths are included under Cripps' classification of adenoma or under the older terms of epithelioma and scirrhus. Hecker[1] found twenty-one cases of epithelioma in thirty-four cases of cancer. Cripps says: "I have failed to discover" (in the rectum) "any growths or tumors consisting entirely of the characteristic structure which pathologists designate as scirrhus or medullary cancers, or as belonging to the various varieties of sarcoma. Considering the eminence of many careful observers who have applied such names to these growths, it would be quite unjustifiable to assume that such distinctive structures never form the entire bulk of the tumor; but I feel bound to state that, with perhaps a more than average opportunity of examining such growths from the rectum, I have been unable myself to discover tumors composed entirely of the distinctive features appertaining to these diseases."

Cancer of the rectum, like cancer elsewhere in the body, generally occurs in middle life or old age. There are, however, some interesting exceptions to this rule. Allingham[2] reports a case of encephaloid in a boy of seventeen, under his own care, and another (variety of cancer not stated), under the care of Mr.

[1] Schmidt's Jahrbücher, 1870.

[2] "Diseases of the Rectum," London, 1869, p. 265.

Gowland, in a boy not thirteen ; Mayo [1] speaks of one at the age of twelve, and Godin [2] of one at fifteen years ; Quain [3] quotes one, reported by Busk, at sixteen ; and Despres [4] reports an epithelioma in a child of six. After the age of twenty the cases increase rapidly in number. With regard to the relative frequency in the sexes, different statements will be found in the works of different writers, according to the experience each has had, and considerable reasoning has been indulged in to explain why the disease should be more common in the one sex than in the other. In a collection of one hundred and seven cases, I have found fifty in males and fifty-seven in females.

The locality in which the disease first appears varies. Quain[5] says : "I have most frequently met with the lower margin of the deposit at the distance of from two to three inches above the orifice of the bowel. The part between that just indicated and the anus is next in order of frequency as the seat of the disease, and to this succeeds the lower end of the colon." This perhaps expresses the facts of the case as well as they could be stated in a few words. The upper limit of the rectum, where it joins the sigmoid flexure, is a common site of the disease, and here it runs a more rapid course than elsewhere, and is more apt to be suddenly fatal on account of the increased liability to obstruction which the anatomical condition favors.

The symptoms of cancer of the rectum may be classified as follows : pain ; those due to contraction, to ulceration, to invasion of neighboring parts ; and, lastly, the generalization of the disease and the cachexia.

A cancer of the rectum may, and often does, begin so insidiously that its existence is not suspected by the patient till it has made irreparable progress. This will be the case particularly when the disease is well up in the bowel beyond the reach of the sphincters. The slight sensitiveness of the mucous membrane of the rectum proper which permits the existence of extensive ulceration, and the application of escharotics and the performance of surgical operations without pain, has been already referred to. On the other hand, cancer of the rectum is usually attended with great pain, and the character of the pain may be of great assistance in diagnosis.

[1] "Injuries and Diseases of the Rectum," London, 1833, p. 188.
[2] Mollière : "Traité des Maladies du Rectum et de l'Anus," Paris, 1877, p. 580.
[3] "Proc. of the Path. Soc. of London," 1846–47.
[4] Gaz. des Hôp., November 2d, 1880.
[5] Op. cit.

Attention has been called to the point in diagnosis that the existence of pain or cramp in the lower extremity in cancer of the rectum is a bad sign, suggesting a direct encroachment upon some of the neighboring nerves, either by implication and pressure of the glands, or by direct extension of the original disease.[1] In the later stages of cancer the pain is often the most important symptom to be met by treatment. It may then be due to the irritation of fæces upon an ulcerated surface, to the involvement of the anus in the ulceration, or to direct pressure on adjacent parts, and each of these is to be met by a different and appropriate treatment.

The symptoms directly referable to contraction of the bowel are often slight, and differ in no way from those caused by the simple, fibrous stricture of the same part. It is often astonishing to the surgeon to meet with an advanced case of scirrhus in which the calibre of the bowel is so nearly occluded as scarcely to permit the passage of the end of the finger, and yet in which the patient has never had sufficient uneasiness to call for a direct rectal examination.

The hæmorrhage from an ulcerated rectum in cancerous disease is seldom profuse enough to be dangerous, though by frequent repetition it may become an important factor in the ultimately fatal result.

Above the contraction there often develops an ulceration which is not to be confounded with the breaking down of the cancer itself. When the cancer itself once begins to break down and ulcerate, its extension is limited by no tissue of the body. The bladder may be opened and a permanent fistula result, in which case the passage is generally from that viscus into the rectum; but the opposite may be the case—and the pain caused by the entrance of fæces into the bladder and their discharge through the urethra is one of the best of all the indications for colotomy. The prostate and seminal vesicles in the male and the recto-vaginal septum in the female may each be destroyed; in fact, any part near the disease may be implicated. Smith[2] has recorded a case in which the disease opened into the hip joint, and Mollière[3] another in which it invaded the soft parts in the loin.

There are two sets of lymphatics which may be involved in malignant disease of the rectum, one coming from the anus

[1] Hilton: "Rest and Pain," p. 163.

[2] "Surgery of the Rectum," London, 1871.

[3] Op. cit., p. 565.

and going to the glands in the groin ; and one coming from the rectum proper and going to the glands in the hollow of the sacrum and lumbar region. The proper place, therefore, to feel for glandular involvement in disease within the sphincter is along the spine, deep in the pelvis—a simple point which may decide the surgeon for or against operative interference.

From what has been said it is evident that there is little in the history which the patient will give of cancer of the rectum to distinguish it from ulceration and stricture of any other variety, except that when a patient of middle age complains of bloody and mucous discharges and difficulty in defecation, which have come on within a short time, and is at the same time losing flesh and strength, the examiner's suspicions should be aroused. The diagnosis must rest chiefly upon a physical examination, however, and to make such an examination thoroughly, and yet safely, requires great care and gentleness, and to properly interpret the conditions which may be found, no little experience and knowledge.

In the majority of cases the diagnosis may be made by the history and by physical examination with the finger alone. Cancer in this locality is a disease of rapid growth, and when a patient says that stricture has existed any considerable number of years the idea of malignancy may be abandoned. Something also may be learned from the general appearance of the patient, but most of all from the digital examination. When the disease is seen in its earlier stages, the hard, more or less distinctly circumscribed new growth which has infiltrated the wall of the bowel is diagnostic. (Fig. 130.) The great difficulty is to distinguish between an advanced case where the rectum is partially occluded by hard masses of disease, and an old case of stricture and ulceration which is not malignant. This may sometimes be impossible except by the microscope, and syphilitic disease of the rectum is not infrequently mistaken for cancer. When a soft, friable mass of epithelioma is found seated on a hard, infiltrated base which is ulcerated in spots, the edges of the ulcers being hard and raised, the diagnosis is also easy.

Cancerous stricture of the sigmoid flexure, or of the upper part of the rectum above the limit of digital examination, is the most difficult to diagnosticate, and may sometimes escape the most thorough search. It may also end fatally from acute intestinal obstruction before it has caused sufficient symptoms to make its existence suspected ; for this part of the canal is very movable, easily forced out of its natural relations, and subject

to complete occlusion by an amount of new growth which lower down in the rectum would cause only slight difficulty in defecation. I know of no other means of diagnosis in these cases than those already described under non-malignant stricture at this point; but the experienced examiner, if he suspect malignancy, is much more cautious than with non-malignant disease in the use of the bougie, for he knows how easily a cancerous stricture will tear and cause sudden death.

In cases where the condition is more complicated and where secondary deposits—in the liver, for example—have begun to

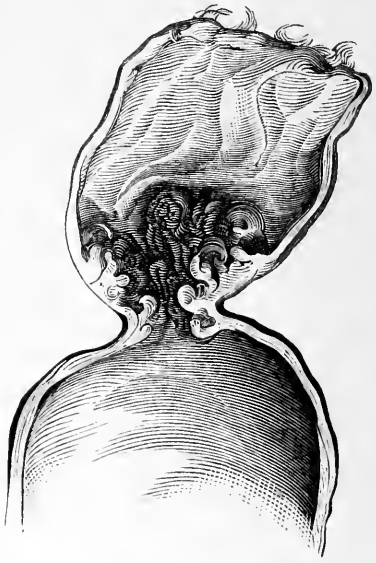

FIG. 130.—Cancer of the Rectum. (Agnew.)

do their fatal work before actual obstruction has begun, the symptoms of stricture may all be obscured by the presence of others which shall more readily attract the eye. In one case I had made the diagnosis of cancer of the liver with ascites and great intestinal disturbance, some time before my attention was called to the rectum, and it became evident by examination that the affection of the liver was secondary to malignant disease high up in the rectum, which was also gradually involving the pelvic viscera.

Treatment.—The treatment of malignant disease of the rectum is designed to be either curative or palliative. In a small

number of selected cases a cure is, perhaps, possible, as with cancer of feeble malignancy in other parts of the body—*e.g.*, epithelioma of the lip. At all events, the disease may be removed, and its return delayed for many years. This fact may be accepted as proved by a sufficient number of carefully examined cases, from which the chances of error in diagnosis and subsequent history have been eliminated. Cure can, however, only be effected by excision.

The operation of excision, which, after being fully described and ably advocated by Lisfranc in 1830, was allowed to fall into disuse, has again, within the past few years, become popular. It would probably be a waste of time to inquire to whom the credit of reviving it is due. Cases of its occasional performance are scattered through the surgical literature of the rectum from the early part of the century to the present, and just now it is at the height of its popularity. Like every other surgical procedure at that point of its history, it is perhaps also occasionally done when it were better to be content with less radical measures. As a result of a careful search among the statistics of this operation, Cripps[1] gives the following figures: Out of a total of sixty-four cases, eleven died as a direct result of the operation, six from peritonitis, one from cellulitis, and four from accidents incident upon any surgical interference.

In the fifty-three cases of recovery, the subsequent history is unknown in sixteen, and in three more the diagnosis was so doubtful as to exclude them from the list. We have, then, a remainder of thirty-four, in whom the disease returned in twenty; but of these twenty, several were operated on a second time for a recurrence of the growth, or possibly for a small nodule which had not been removed at the first operation, and after this second operation remained free. This leaves, however, a total of twenty-three out of sixty-four operations in which the disease had not returned after an interval varying from a few months to over four years—a limit reached in three cases.

This is certainly an encouraging result for this disease, and the fact that undoubted cancer may be removed and not reappear for such a length of time is decisive. Some operators, however, report better results than these, and some have not been so successful. Curling[2] gives one case of removal of an epithelioma in which there had been no return in the rectum after seven years, though for one year there had been "a doubt-

[1] Op. cit., p. 166.

[2] "Diseases of the Rectum," ed. of 1876, p. 164.

ful tumor of the pelvis." Velpeau and Verneuil each report cases in which the cure has seemed permanent, and Chassaignac gives several in which there had been no return after six years. Dieffenbach's thirty cases in which the patients lived many years without a return are generally looked upon with suspicion. Allingham,[1] on the contrary, considers the *partial* removal of the circumference of the bowel as unsatisfactory. In all of his thirteen cases in which he was able to follow the progress of the case for one year, there was either a return of the growth in the rectum or the glands in the groin became affected, and there ensued disease in the internal organs. In four cases the disease did not return in the bowel, but in the inguinal glands, proving that it was not due to an incomplete operation. With regard also to his ten cases of *total* extirpation he speaks very cautiously. He believes that a cure is very uncommon, and not generally to be expected, and he does not commit himself even on the question of the prolongation of life. The mortality, as a direct result of the operation, is generally about twenty-five per cent.[2]

Billroth[3] reports thirty-three cases. Thirteen died of the operation, and the remainder all died within two years, most of them of recurrence.

The deaths immediately following the operation were invariably due to retro-peritoneal suppuration, characterized by acute septic symptoms. Most of them died within from four to eight days.

Since, then, we are justified in expecting recovery from the operation itself, and such a length of life as would not result were the disease left to its natural course, we may ask: 1. What are the dangers and what is the mortality of the operation? 2. In what class of cases is it applicable? 3. What are its results as a curative and as a palliative measure, and how do these results compare with those of colotomy? 4. What are the results as regards the subsequent condition of the bowel, and the control of the fæcal evacuations? 5. What is the best method of its performance?

For the purpose of arriving at a knowledge of what experience has already taught in this matter, I collected, several years ago, the reports of operations up to that time as far as they were

[1] Loc. cit., p. 277.

[2] Mollière: "Traité des Maladies du Rectum et de l'Anus," Paris, 1877, p. 627.

[3] "Clinical Surgery: Extracts from the Reports of Surgical Practice between the Years 1860-1876." By Th. Billroth. New Sydenham Society, 1881.

then attainable. The list at that time included one hundred and forty cases, and I arrived at the following general conclusions concerning the operation, which subsequent study of the question has led me in no way to alter.

1. Although there have been a few cases of excision in which the cancer has not returned in a number of years, such a result is so rare as not to justify the exposure of the patient to the risk of immediate death which attends the attempt to remove very extensive disease.

Regarding the question of radical cure, we find difficulty in establishing exact dates, and have to take into consideration the reputation of the reporter. We find, however, that in one hundred cases (deducting those immediately fatal, and seventeen which passed out of observation immediately after operation) we have five cases of reported permanent cure, in which there had been no return for at least ten years. Three of these are reported by Volkmann, and two by Velpeau. March, of Albany, has been credited with another case of radical cure, but the author is much indebted to the present Dr. March for a letter stating that the case of supposed radical cure reported by his father passed out of observation at the end of one year. There are some other cases which have been included in the category of permanent cures—cases in which the disease had not returned in four or five years—but the great majority recur within the first year and are fatal within two.

2. The operation is therefore of great value as a palliative measure, and as such it compares favorably with colotomy both in prolonging life and relieving pain.

The treatment of cancer of the rectum by excision has not yet been accepted by the surgical world as a substitute for other measures, even in cases best adapted for the operation, although it cannot be denied that a radical cure has sometimes been obtained, and that in many other cases life has been prolonged beyond what could have been hoped for by any other means of treatment. It is no less true that the operation is one of great danger, and that there are not lacking those whose experience has led them to believe that life was rather shortened than lengthened by it. By these it is claimed that in colotomy we have a safer method of relieving pain and delaying the progress of the growth, and in both these ways prolonging life.

Excision can scarcely be judged in comparison with colotomy, being applicable properly only to an entirely different class of cases. In cancer above four inches from the anus,

colotomy is about the only means of relief. In cancer within four inches of the anus other plans of treatment may be preferable.

In cases properly chosen, where the disease is not so extensive as to render its removal one of the capital surgical operations, we know of nothing better as a palliative measure, and this fact cannot fail to be deeply impressed upon the reader of these cases. The statement that all suffering was relieved is almost invariable. In almost every case attention is called to the great improvement in general health, the loss of pain, and the increase in strength. Patients go away believing themselves radically cured, return to their employments, and are reported by the French surgeons as "*parfaitement guéries*" a few weeks after the operation.

It has been claimed[1] against this operation that even when a good immediate result is obtained, it may shorten life by hastening the return and final progress of the disease. Unfortunately, it is difficult to tell in any particular case how long a patient would have lived had the disease been left to its course; but, accepting as a basis for comparison Allingham's estimate of the average duration of life in cancer of the rectum as two years or less, we are justified in concluding that in all cases where life was prolonged more than one year and a half after the time of operation (the operation generally being done late in the disease), this length of life may fairly be attributed to the surgical interference. This estimate is manifestly a small one, for a study of the cases makes it evident that many who did not live eighteen months after the operation yet gained a considerable length of comfortable existence; and there is nothing to prove that in any case the operation hastened the natural course of the disease.

I have carefully searched the record of cases in which a return of the disease within six months of the time of operation is reported, to discover whether here also there was any marked relation between this result and the nature or extent of the disease at the time of operation; but it is especially at this point that the table fails us. A proper answer to this question involves not only a careful report of the extent of the disease, but a microscopic study of its character, and such data are given only in a relatively small proportion of cases. I believe, however, that the cases show a marked relation between the

[1] Labbé: Gaz. Hebdom., June 4th, 18th, 1880.

rapidity of the growth before operation and the speedy return after removal.

3. When the disease reaches above four inches from the anus, or involves neighboring parts so as to render its entire removal questionable, the operation is contra-indicated.

The Germans have apparently no limits to the applicability of this operation. They perform it in cases of the most extensive disease, opening the peritoneum, exsecting the sacrum when necessary to reach its upper limit, and removing the prostate and base of the bladder when they are implicated, balancing the risk of immediate death from the operation against the chance of radical cure or prolonged immunity from return. Conservative surgeons will hesitate long before accepting this view, for, although very satisfactory results have been obtained in such cases, a study of cases shows that the frequency of the fatal result is in direct proportion to the extent of the operation attempted. The rules for the selection of cases laid down by Lisfranc were these: when the bowel is movable, in other words, when the disease has not involved surrounding parts, the operation should be undertaken. When, on the other hand, the disease is more extensive and reaches higher, he leaves the question to be decided by future experience. I believe that experience, in spite of the favorable reports from the German operators, will ultimately decide in favor of inguinal colotomy in this class of cases.

Although there is a very evident relation, which is shown by a study of the statistics of the operation, between the extent of the operation attempted and the favorable or unfavorable results obtained, a fatal result may follow the extirpation of disease which is comparatively slight in amount. The three great dangers of the operation are peritonitis, pelvic cellulitis, and septicæmia. Hæmorrhage may fairly be dropped out of consideration, for the operation may, if desired, be rendered almost bloodless by the use of the *écraseur* or galvano-cautery.

4. The operation is not followed by any annoying after-consequences which are of sufficient gravity to contra-indicate its performance.

In a small proportion of cases there will be complete incontinence; in a greater number there will be partial control over the evacuations; in a majority the control will be sufficiently complete to prevent the occurrence of any annoying accident; in some there will be cicatricial stenosis, and a fæcal fistula is apt to follow the high operation.

Stricture to a troublesome extent may generally be overcome by the introduction of bougies. In one case reported by Verneuil, a special plastic operation was performed to relieve this condition, an account of which may be found in the work of Marchand.[1]

Regarding the best way of performing the operation, the surgeon has his choice of several. The first case of extirpation of the rectum of which we have any record was by Faget, in 1739, and was not for cancer, but simply a removal of the lower portion of the bowel, which had been completely surrounded and denuded by an abscess beginning in one ischio-rectal fossa and subsequently extending into the other. From that time until 1826 the operation, as a means of treatment of cancer, will occasionally be found mentioned in surgical literature; generally, however, only in condemnation. In 1826 Lisfranc performed the first successful operation for cancer; and three years later his student, Pinault, in a *thèse* reported nine cases, and gave to the procedure a permanent place in literature and practice. In 1833 Lisfranc himself embodied the same ideas in a paper read before the Acad. Royale de Médecine,[2] and from that time the operation became widely known. Since then it has had its advocates and opponents, and has been subject to many modifications in its performance. For a long time it was coolly received by British surgeons, but within the past decade it has received a new stimulus from the Germans, and at the time of writing it seems to have been fairly tried by the surgical world, and can now be judged on its merits.

Almost every surgeon whose name is prominently associated with the operation has had his own favorite way of performing it, but all of these may now be grouped under two general heads: the operation through the perineum, and Kraske's operation, or excision by an incision at the side of the sacrum.

The operation performed by Cripps possesses several advantages in facility of performance. The preliminary dorsal incision is made from within outward by passing a strong curved bistoury into the rectum, bringing its point through the skin at the tip of the coccyx, and cutting all the intervening tissue. The buttock is then drawn away from the anus to put the tissues on the stretch, and a lateral incision made from the preliminary cut behind, around the rectum to the median line in front. The

[1] "Étude sur l'extirpation de l'Extrémité inférieure du Rectum." Marchand, Paris, 1873.

[2] Mém. de l'Acad. Roy. de Méd., 1833, iii., p. 296.

site of this incision, whether inside or outside the anus, will depend upon the location of the disease and whether or not the anus is implicated. The cut itself should be made boldly, and deep enough to reach well into the fat of the ischio-rectal fossa. The forefinger in this incision will readily separate the bowel from the surrounding tissue, except at the attachment of the levator ani muscle, which should be divided with the knife or scissors. A piece of sponge is pressed into this cut to restrain the bleeding, while the opposite side is treated in the same way. The anterior connections give more difficulty, and the dissection in the male is aided by having a sound in the urethra. The knife and scissors replace the finger in this part of the operation. When the dissection has been carried to a point above the disease, the bowel is drawn down and held while the wire *écraseur* is passed over it, and the section made at the required level. After this there may be free but seldom serious hæmorrhage. The vessels divided in the first steps of the operation all come from the wall of the bowel, and if ligatured when first cut, are again opened with the *écraseur*.

When the disease is located to one side of the bowel, the operation is modified accordingly. The preliminary dorsal cut is the same, and the lateral incision is made on the affected side. At the farther end of this lateral incision, away from the dorsal one, a needle carrying a cord in its point is passed around the disease and into the rectum above it. The loop of cord is brought out of the anus, attached to the chain of the *écraseur*, and withdrawn as it entered. The chain is then made to cut its way out, and a rectangular piece of the rectum is thus included between two longitudinal incisions, one posterior with the knife and one lateral with the chain. In this rectangle is the cancer, and it is dissected upward from below, and separated above by again using the *écraseur*.

Instead of the chain or wire *écraseur*, the wire of the galvanic cautery may be used, heated to a dull red and not a white heat, if the desire is to avoid hæmorrhage. Or, again, instead of the wire the galvanic cautery knife may be used and the operation performed with bloodless incisions. This is the operation favored by Verneuil. The rectum is first divided into lateral halves with the *écraseur*, as in the method of Chassaignac, the cut dividing both the anterior and the posterior walls. Then with the galvanic cautery blade the lateral halves are separated from their attachments stroke by stroke until a point is reached above the level of the disease. The chain is again

slipped over the end of each and the final section made; but a good operator will not be troubled by a very alarming hæmorrhage, and can work much more rapidly if he discards these precautions and trusts solely to knife, scissors, and rapidity of execution.

Certainly the quickest, and, of all the operations with the knife, the least bloody, is the one devised by Allingham, Jr., and figured in the three following cuts.

The patient being held in the lithotomy position by Clover's crutch, the index finger of the left hand is introduced into the rectum as high as the limit of the disease, and the knife is entered through the skin outside of the anus and carried upward in the cellular tissue behind the gut as far as the finger in the rectum

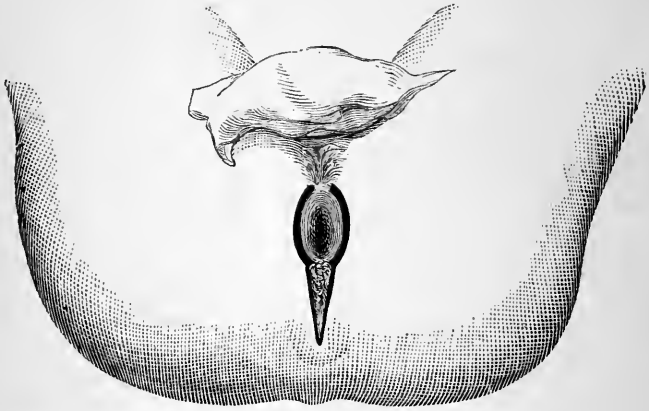

FIG. 131.—(Allingham.)

shows it to be necessary. A deep dorsal cut is then made down to the tip of the coccyx, and past this point if necessary for room. Next the rectum is divided circularly between the lower limit of the growth and the external sphincter, if possible. This incision should go deeply into the cellular tissues, and is ended by dividing the external sphincter posteriorly. In this way the sphincter is left in the skin flaps. The diseased rectum is still to be dissected out as a cylinder, and this should be done boldly and rapidly with knife and scissors till the enucleation has proceeded to a level at least half an inch above the disease. The wound should be packed with sponges as fast as the cutting proceeds, and when the gut has been entirely freed from its attachments the sponges may be removed and the vessels attended to. The bleeding will not be excessive unless the operator stops

to tie each one as it is cut. After the bleeding has been stopped and the sponges removed, the rectum should be amputated with the *écraseur* or knife, care being taken not to lose the upper end,

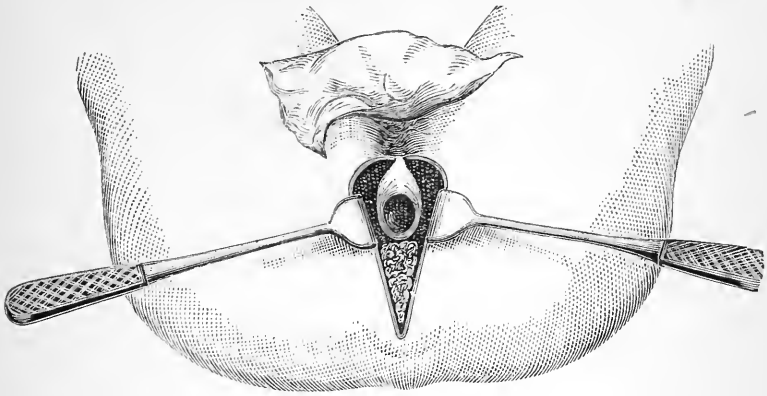

FIG. 132.—(Allingham.)

but to keep it in sight with a vulsellum till it has been attached by a few stitches to the skin of the anus.

The rectum should not be drawn down too tightly by sutures,

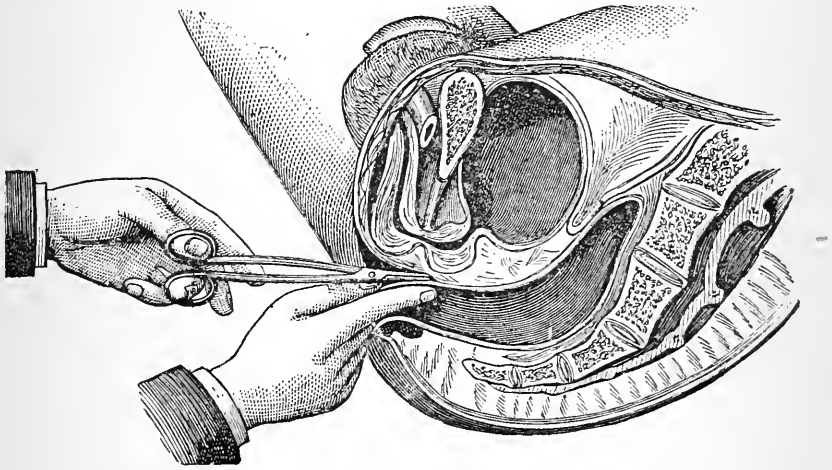

FIG. 133.—(Allingham.)

lest they tear out in the first day. The wound should be fully drained and stuffed with iodoform gauze, and no attempt should be made to get union by first intention.

I have seen this operation answer equally as well in a case where, because of the involvement of the anus, the circular incision was made through the skin far out in each fossa.

A wound into the vagina, though always to be avoided when possible, may often be necessary in order to fully remove the disease. When the fistula thus made is not too extensive, it may be closed immediately after the operation. If large, it must be left. A wound of the urethra in the male, when slight, is to be treated as though the patient had submitted to an external urethrotomy, by the frequent passage of the sound to prevent contraction. When a large piece has been taken from the urethral wall, a permanent recto-urethral fistula is the necessary result, and the danger of fatal inflammatory action is greatly increased from the presence of the urine in the rectal wound. Wounds of the peritoneum should be sutured with catgut. As for the cases reported by Nussbaum and others, in which the whole neck of the bladder, the greater part of the prostate, and the seminal vesicles have been removed, and the patients have lived for years in comfort, they are merely curiosities of literature. That such a thing may happen has been proved, but that the operation should ever be undertaken in any case where such a result is necessary for the entire removal of the disease, has yet to be proved.

Kraske's operation[1] consists briefly in making a median cut from the second sacral vertebra to the anus ; severing the left gluteus maximus from its sacral attachment ; excising the coccyx ; detaching the sacral connections of the tubero-sacral and spinoso-sacral ligaments ; and chiselling away the lateral mass of the sacrum in a curved line which begins at the outer border of the third sacral foramen and terminates at the corner of the sacrum. The anus being next freed by a circular incision, the rectum is detached from its bed ; the peritoneal cavity is opened also by a circular cut ; the gut drawn well down and amputated above the tumor, and its end fixed by sutures to the para-anal tissues. The operation is completed by inserting a drainage tube into the peritoneal cavity and plugging the rectum and wound with iodoform gauze.

In his first case the disease recurred at the end of four months. In seven subsequent cases by Kraske, three by Schönborn, one by Rinne, and one by Lauenstein, the anus and lower part of the rectum were spared, and about two-thirds of the anterior wall of the central end of the gut were united by sutures

[1] "Verhandlungen der Deutschen Gesellschaft für Chir.," bd. ii., 1885.

to the peripheral end, the posterior segment of the gut being left open for the escape of fæces. Of these twelve cases six died —two of exhaustion, one of sepsis, one of peritonitis caused by giving way of the sutures and the entrance of fæces into the peritoneal cavity, and one of iodoform poisoning. Of the seven recoveries, two had fistulous openings at the end of three, three and a half, and five months respectively; in two the healing was not complete till the end of six and eleven months respectively; and two were recorded at the end of one and three months respectively. Hence, of the entire number thirty-eight per cent died, and there is no record of any permanent cure.

The serious objection to this method seems to be that the peritoneal cavity is not closed, and that contact of fæcal matter with the wound prolongs the healing process, favors septic complications, and results in the formation of a sacral artificial anus. To overcome these disadvantages Schede [1] describes three cases in which, after following the preliminary steps of Kraske, he introduces certain modifications. In the first case he attached the divided peritoneum to the serous surface of the sigmoid flexure of the colon, thereby closing the cavity of the belly, and left the anus, sphincters, and lower end of the gut intact, and secured it to the central end with two circular rows of sutures, of which the first included the mucous membrane and the second the other coats of the bowel. The wound was dressed with iodoform gauze, and opium administered to control the stools. The result was not wholly satisfactory; the ends of the gut did not entirely unite by primary intention, and nearly a year elapsed before the complete closure of the small fistulous track. The sphincters retained their functions, however, and there was no difficulty from involuntary evacuations.

The great value of closing the peritoneal cavity is shown in two of Kraske's cases in which it was omitted, although complete union of the divided ends of the bowel was attempted. In both instances the stitches gave way, during a stool which occurred a few hours after the operation, despite previous efforts to thoroughly empty the bowel and the subsequent exhibition of opium, and death ensued from peritonitis from fæcal extravasation.

The protracted healing in this case of Schede was due to contact of fæces with the sutured bowel. Hence, in the other two operations, immediately after resecting the rectum he made an

[1] Deutsche med. Wochenschrift, No. 48, 1887.

artificial anus between the belly and descending colon. In the first of these four-fifths of the rectal wound united by first intention and the remainder by granulation, while the other wound had closed in two months and a half. The artificial opening was then remedied, and at the end of four months from the primary operation the patient was discharged. The second of these cases followed a very similar course.

Considering the two methods together, the operation has been performed at least eighteen times with seven deaths—a mortality about equal to that of Bardenheuer's procedure of removing anus, sphincter, bowel, and tumor, opening the peritoneal sac, drawing down the divided gut, and attaching it to the perianal tissues.

Although Kraske in his first paper had suggested the idea of transverse division of the sacrum and resection of the cancerous mass, this part of the procedure was more fully developed by Rinne and Bardenheuer.

Rinne[1] resected seventeen centimetres of the rectum, leaving the lower ten centimetres intact, and suturing the two ends of the gut in their anterior half only, leaving the posterior open for drainage and the escape of fæces. His case died on the fourth day with an anomalous chain of symptoms which he attributed to iodoform poisoning.

Bardenheuer[2] clearly drew the line between amputation and excision, and extended the scope of the latter operation to cover recto-vaginal and rectal fistulæ which are not amenable to other treatment because of the size of the defect, the adhesions of the gut to the pelvic wall by cicatricial tissue, the kinking of the rectum, or the formation of a valve just above the fistula. He also recommends the operation in cases of benign stricture where incision and dilatation have proved ineffectual.

The operation is performed in the breech position with the buttocks slightly elevated. The incision through skin and superficial fascia reaches from the posterior border of the anus to the middle of the sacrum, and the soft parts are detached from the posterior surface of that bone. The greater and lesser sacrosciatic ligaments are separated from their attachment to the sacrum, and the latter is divided transversely at the level of the third sacral vertebra, allowing the entire hand to be introduced into the pelvis. The left index finger is next introduced into the rectum till the tumor is reached and pressed backward

[1] Cent. f. Chir., No. 14, 1886.

[2] Volkmann's Klinische Vorträge, No. 298.

against the primary incision, which is then continued till the posterior wall of the rectum is exposed in the wound. Both index fingers are then introduced into the wound, and the tissues are torn apart to widen it in all directions. The left index finger is next introduced into the rectum, while the right, guided by the left, detaches all the tissues on the inner aspect of the levator ani muscle, around the rectum below the tumor. A loop having been passed under the isolated portion of the rectum, it is drawn out into the wound, and the tumor itself is separated from its bed in the same manner, first on its posterior and then on its anterior aspect, where in many instances the peritoneum can be separated without opening its cavity. Should, however, the cavity of the peritoneum be opened, it is plugged with thymol gauze and the operation completed by dividing the gut four centimetres above and two centimetres below the limit of the disease. The ends of the bowel are united by two rows of continued suture, one including the mucous membrane alone and the other the remaining coats. The wound is finally plugged with iodoform gauze.

If the tumor is located near the prostate, it will be necessary to carry the primary incision further forward as far as the scrotum, dividing the sphincters. The rectum is next divided transversely from inside below the tumor, and resected as before. Amputation is done in the same way, except that the primary incision surrounds the anus and is then continued posteriorly to the sacrum. If so much is amputated that the upper end cannot be drawn down to the anus without danger of gangrene from tension, it should be sutured to the base of the bladder.

Although Kraske approves of the transverse section of the sacrum practised by Bardenheuer, when it is necessary, he contends in his later paper[1] against its adoption as the general rule of operation, and holds that a chiselling away of the side of the bone is preferable when it answers the purpose. He describes his own later method as follows: The patient is placed on the right side, and an incision is made from the middle of the sacrum to the tip of the coccyx, extending down to the bone. The soft parts are detached on the left to the border of the sacrum, and the left sacral and coccygeal ligaments are divided as far up as the third sacral foramen. The soft parts on the right of the coccyx are next divided, and that bone is removed with bone forceps. If now, with the soft parts held widely apart, the portion of the rectum to be removed is accessible, no further exci-

[1] Berl. Klin. Woch., November 28th, 1887.

sion of the sacrum is necessary. If not, then the sacrum may be chiselled away on one side, or even divided transversely across as Bardenheuer proposes. After this he either resects or amputates, depending upon whether the anal portion is healthy or involved in the disease. Resection may be done by following the line of incision already made. In amputation the incision must be extended further forward. He contends for the union of the upper and lower ends by suture after resection, and has always found it possible to do this in his own practice.

In certain cases where from the extent of rectum removed it is impossible to draw the ends together, or where from the

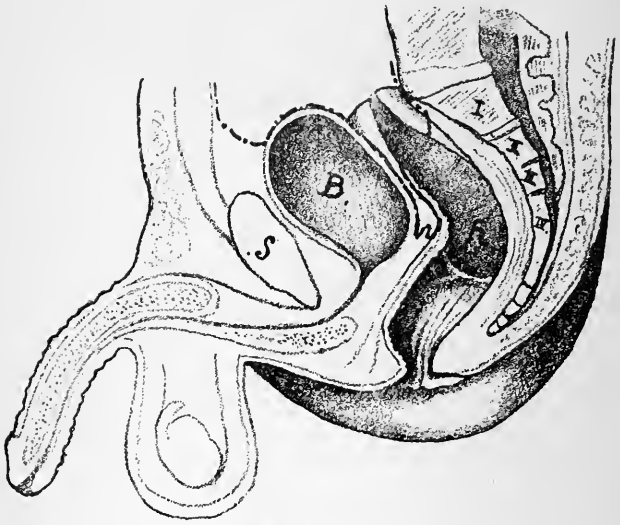

Fig. 134.—(Hochenegg.)

tightness of the stricture it has been impossible to empty the bowel above of fæces, or where the wound has become soiled with the same during operation, Kraske postpones the suturing of the ends of the gut at the posterior segment till a future period, and forms a provisional sacral artificial anus as shown in Figs. 134, 135, 136, 137. For this a subsequent plastic operation is necessary. Hochenegg[1] has devised and applied the truss shown in the cut for use in these cases.

Schede accomplishes the same end by a colotomy in the groin after the resection, and a subsequent closure of the artificial anus when the sacral wound has healed.

[1] Wien Klin. Woch., July 12th, 1888.

The dangers of this operation are hæmorrhage, shock, and

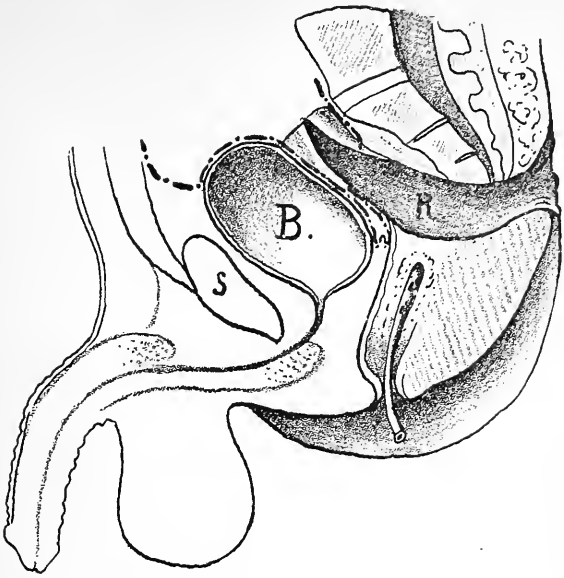

Fig. 135.—(Hochenegg.)

septic periproctitis. Bardenheuer's operation commends itself as

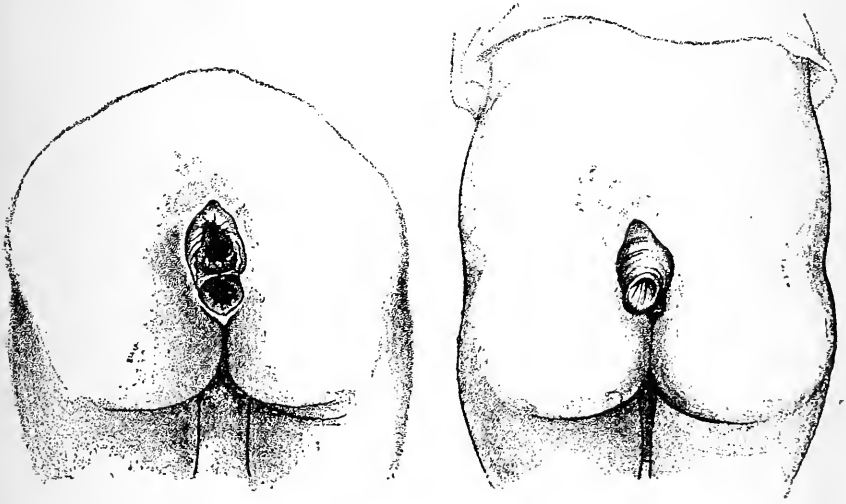

Fig. 136.—(Hochenegg.)

being quicker of performance than Kraske's (he usually allows

fifteen or twenty minutes for its completion), and therefore as involving less danger of shock and hæmorrhage.

The statistics of the operation are difficult to obtain with exactness, scattered as they are through German periodical publications. Hochenegg, in his last report[1] of his own cases and those he could gather from others, gives the following figures as the result of Kraske's method, but he does not include Bardenheuer's work, which he considers as an essentially different procedure. Out of thirty-nine cases, thirty-one recoveries and eight deaths. Of primary circular suture of the gut there were nine cases with three completely successful results, one of partial

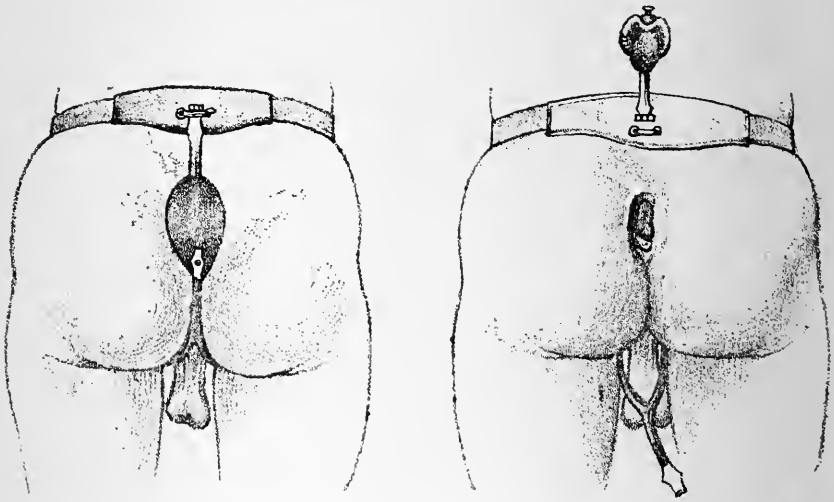

FIG. 137.—(Hochenegg.)

healing, and five fatal. The fatal cases were due, one to iodoform, one to sepsis after forty-two hours—in this the base of the bladder was opened—two from stercoreal peritonitis, one of subacute sepsis at the end of the second week. Two cases of complete circular suture and provisional colotomy recovered. Seven cases were treated by partial suture of the anterior wall of the gut and provisional sacral anus: of these six recovered and one died. Three cases were treated by suture and division of the healthy anal portion backward; all recovered with good sphincteric action. Fourteen cases were treated by the formation of a permanent sacral artificial anus; of these twelve

[1] Wien Med. Woch., July 19th, 1888.

recovered and two were fatal. The mortality of all was 20.5 per cent.

The mortality reported by Bardenheuer is less than this, and he believes that it can eventually be reduced to five per cent, except for complications such as opening the bladder. König reports a mortality of twenty-four per cent.

Von Bergmann[1] prefers the operation to colotomy, and quotes Bramann's statistics—twenty-seven cases and one death.

Levy[2] has worked out on the cadaver another method of resection of the upper part of the rectum, which he thinks preferable to that of Kraske, in that it leaves the floor of the pelvis almost intact.

The first incision is made horizontally across the sacrum about half an inch above the cornua coccygia. This should be from four to four and a half inches long, and should extend to the bone. From the two ends of this cut two cuts are made downward, about four inches, through the entire thickness of the gluteus maximus. In one of these vertical incisions a bent hook is inserted and the soft tissues pulled well outward. The lateral portion of the posterior sacro-sciatic ligament is thus laid bare, and both the posterior and anterior sacro-sciatic ligaments are divided close to the edge of the bone, in the line of the horizontal incision. The same thing is then done on the opposite side, and by means of an elevator the connective tissue on the anterior wall of the sacrum is freed. The skin flap, with the bone attached, is then turned down by a strong hook, and a large portion of the rectum is brought into view. Through this opening, after the connective tissue has been separated, one is able to reach downward to within three-quarters of an inch of the sphincter and upward to the sigmoid flexure. If it be necessary to cut away still more of the sacrum, it can easily be done.

After resecting the bowel the ends are brought together by a double row of catgut sutures, the flap is brought back to its original position, the excised portion of the sacrum brought into place by bone-suturing, and the horizontal incision closed. The perpendicular incisions may either be packed with iodoform gauze or else closed, except at their lower extremities, which should be left open for drainage.

This operation is based on the fact that, as the floor of the pelvis is left intact, neither incontinence nor prolapse is apt to follow the resection.

[1] Beilage zum Centralb. f. Chir., No. 24, 1888.

[2] Cent. für Chir., March 30th, 1889.

To those who hold that nearly all cases of rectal cancer are suitable for treatment by some modification of the operation of excision, Hildebrand's report of the results of this work in König's clinic (*Deutsche Zeitschrift für Chirurgie*, band xxvii., hefte 3, 4) will not be encouraging. While it has been abundantly demonstrated that very extensive disease may be removed, and the technique of the operation has been so greatly improved that nearly any part of the rectum may be reached and extirpated rapidly and with comparative safety as to the immediate result, the advisability of such treatment has not as yet been established. The operations are done because they are manually possible and surgically justifiable, and because in this way only can the proper limits of operative interference be marked out.

Hildebrand's statistics cover fifty-four extirpations in sixty-nine cases of disease, with a mortality of thirty-five per cent, which is higher than might have been hoped for. Moreover, exactly one-half of the mortality was due to infection, which only proves that no amount of asepsis or antisepsis can be certainly relied upon to prevent periproctitis. Of those recovering from the operation, thirteen died of relapse and five were suffering from relapse at the time of reporting; but three had lived three years, six over two years, and eight over one year without relapse. A point which is made very plain by this report is that, no matter whether the sphincter is or is not preserved in the operation, sooner or later the condition in all cases is one of incontinence or cicatricial stricture.

The result of Hildebrand's study is to convince him that inguinal colotomy is the proper treatment for cases of extensive disease; or, in other words, to place him in opposition to the tendency toward promiscuous operation at present prevailing among German surgeons. It would seem as though conservative ideas as to this matter were certain after a little time to be accepted, and that operative interference must be limited by the extent of the disease and the amount of involvement of the structures around the rectum, as has been upheld by American surgeons ever since the operation was revived, after having for a long period been in disrepute because its proper field of usefulness was not strictly maintained. The simple facts seem to be that cancer of the rectum is less amenable to the knife than cancer of most other parts; that operation is followed by cure in a very small proportion of cases; that the dangers are great and the results as to comfort very unsatisfactory; and yet that in properly selected cases—those seen early—much good may be done

by operation, and in those seen late an astonishing amount of lower bowel may be extirpated without an immediately fatal result.

The operation of excision has, with the recent advances in abdominal surgery, been applied to cancer of the sigmoid flexure and colon.

Kendal Franks [1] has recently collected fifty-one cases, from which he draws the following conclusions: 1. The operation rarely effected a cure. 2. As a palliative measure it was justifiable and frequently demanded. 3. Recurrence generally took place in the liver or mesenteric glands, and gave an easier death. 4. The mortality after immediate suture of the gut, and after the formation of an artificial anus, is nearly the same. 5. Immediate suture is preferable to the formation of an artificial anus. 6. The death rate has been reduced in the later cases, and a further reduction may be anticipated.

In the discussion following the paper, Bryant said his first impressions on reviewing the whole number of cases were against the operation. In malignant disease of the lower bowel we had to choose between colotomy, colectomy, and tiding the patient down hill, and he thought the conclusion was in favor of colotomy, which gave comfort to the patient, prolonged life, and gave all the benefit colectomy seemed to do. On looking over the table it appeared that only one of the fifty-one cases was cured; there were direct failures in forty per cent, and indirect failures in the others. The operation was, therefore, dangerous and could not be recommended.

Treves also spoke to the same effect. The operation was simply palliative and not curative. Only one case of the series presented no recurrence after four years; and yet cases of cancer which had been colotomized commonly lived three or four years. For six years he had not seen a case in which he would have dreamt of removing the colon for malignant disease. There was a remarkable difficulty in uniting certain parts of the colon. The transverse part and the sigmoid, being covered by peritoneum, were easy, but in the cæcum it was almost impossible, the non-peritoneal surfaces declining to heal, and in many cases an abscess formed outside the gut.

Weir has collected and analyzed thirty-five cases with the following result: In all save one the disease involved the large intestine, and in an additional case the operation was abandoned, only a small piece being removed for microscopic exami-

[1] Lancet, March 2d, 1889.

nation. Five of the cases done during acute obstruction all died of shock. In thirty-three cases there was a mortality of 51.5 per cent, only a little greater than that resulting from excisions for other causes than cancer. Aside from the shock, ten died within forty-eight hours and four died of peritonitis from the escape of fæces.

To Weir's table the case of Penrose, *Med. News*, December 15th, 1888, should be added. It was one of cancerous obstruction of the descending colon, treated by colectomy and by subsequent successful closure of the artificial anus.

Palliative Treatment.—The palliative treatment of malignant stricture of the rectum is in many points the same as of non-malignant. The relief of pain is perhaps a more marked indication in most cases. The pain depends on two classes of causes—those which make cancer a painful disease wherever met with in the body, and those which are due solely to its situation at the outlet of the bowel. Among the first we have pressure upon adjacent parts and involvement of neighboring organs and nerves; and among the second, the passage of fæces over an ulcerated surface, and spasm of the sphincter muscle from irritation caused by its direct implication in the cancerous growth or by the passage over it of irritating sanious discharges from the sore. From this it is easy to understand why cancer is in one person attended by excruciating suffering, while another may hardly be conscious of its presence; and why the pain is in some paroxysmal and particularly aggravated by a movement of the bowels, and in others dull and constant, radiating through the loins and down the thighs. For the relief of this symptom we have at our command: *a.* Regulation of the passages, diet, and the recumbent posture; *b.* Anodynes locally and by the mouth; *c.* Partial destruction of the growth by means of the curette, cauterization, or partial extirpation; *d.* Division of the sphincter; *e.* Colotomy; *f.* Electrolysis.

The passages should be kept soft but not fluid, as any approach to diarrhœa always aggravates the suffering. This may be done partly by the choice of food, which needs to be regulated with great care on account of the tendency to gastric disturbance, more or less of which is always present; and by the administration of the mineral waters, which are generally sufficiently laxative for the purpose. Rest in the recumbent posture is a means of palliation of great value, sometimes giving more relief than anodynes. These latter may be given both by the mouth and in enemata, and if possible should be pushed to the

point of relieving suffering. This seems so plain a duty which the surgeon owes to his patient that we need not stop to discuss any possible moral bearing it may have. If the agony of this incurable malady could always be relieved by the administration of opium, the question of operative interference would arise much less frequently than it now does. But, unfortunately, the constant administration of this or any other narcotic will sometimes cause gastric and mental disturbance harder to bear than the disease. By using the finger-nail, a curette similar to the one used in the uterus, or a scoop such as is used for submucous uterine tumors, the pain may in some cases be greatly relieved by a removal of a part of the growth when of the soft variety. The same may be done by the application of chemically destructive agents or the actual cautery, and even by the partial excision of the mass, merely as a means of relief and where there is no question of cure. I have already called attention to division of the sphincter muscle as a palliative measure in the treatment of rectal disease, and all that was said regarding the treatment of benign stricture applies equally well to cancer.

With regard to husbanding the sufferer's powers and prolonging life, much may be done by careful nursing and medication. Milk is by far the best diet, and cod-liver oil in small doses the best medicine where it can be borne, for it has a laxative as well as a tonic action. Cleanliness is best obtained by frequent washing out of the rectum with disinfecting fluids, as permanganate of potash, carbolic acid, and chloral.

The means of overcoming obstruction in malignant disease are also much the same as in benign stricture, and to what has already been said on that subject we must again refer the reader. Before commencing to treat the obstruction as such, it is well to remember that an exceedingly small outlet to the alimentary canal may, with proper care, be made to answer all the calls of nature. We see this constantly in cases of stricture, both simple and malignant, where the finger cannot be forced through the obstruction, and yet there is no retention; and in such cases, by the judicious administration of laxatives, life may be made so comfortable that the question of surgical interference shall be postponed indefinitely. When, however, obstruction is actually threatened, much may be done by the medical means already pointed out.

When dilatation becomes necessary, it should be of the gentlest kind. The cases of fatal accident from perforation of the bowel where the coats have been weakened by ulceration

are already numerous enough to serve as warnings for all future time. The best of all dilators in cancerous disease is the finger, either that of the patient or the nurse, passed daily, and none of the mechanical means with which we are acquainted equals this for safety and comfort.

When the disease is beyond the reach of the finger, a bougie must be used, but the dangers are greatly increased, and it will be better at once to make an artificial anus than to incur the

FIG. 138.—Simon's Sharp Scoop.

risk of fatal accident which the use of a bougie high up the bowel certainly entails. The frequency with which the bougie may be used will depend upon the result of its trial. Should much irritation, tenesmus, or hæmorrhage follow its employment, the patient will soon refuse to submit to its continuance; while, on the other hand, should the result be favorable it may be employed daily. The softest bougie is the best.

If dilatation be found too painful or ineffectual, as it sometimes will, recourse may be had to division or partial destruc-

FIGS. 139, 140.—Rectal Hooks.

tion of the cancerous mass. A double proctotomy may be done in case of malignant disease, and the section of the growth between the two incisions be removed, in this way opening once more the calibre of the bowel and overcoming the obstruction. I have performed this modified operation with great relief, and I have also found that, after making a single free division of the cancerous mass, large pieces adjacent to the cut could be excised with great facility and without danger.

Relief both to pain and obstruction may sometimes be gained in this way by a partial destruction and extirpation of a cancerous growth, where its entire removal is out of the question and its local return may be expected with certainty. By such measures the evacuations may be made less painful, the spasmodic action of the sphincter and the rectal tenesmus may be allayed, the cancerous look may for a time disappear, and the patient recover sufficient strength to resume the ordinary occupations of life.

A growth may be attacked in this way either with the knife, cautery, finger, curette, or electrolysis. I have not been well satisfied in several cases with a modified operation which consists in first dividing the stricture posteriorly, together with the parts between the disease and the skin, with the cautery knife, next removing considerable portions, if they can be isolated, with the wire *écraseur*, and finally resorting to the sharp scoop of Simon (Fig. 138). In these operations the hooks shown in Figs. 139, 140 will be found very useful. By these means combined a large portion of the disease may be removed, and the lumen of the bowel may be almost completely re-established; and yet I cannot recommend them, having had one case of nearly fatal secondary hæmorrhage and two fatal cases of proctotomy. If any operation is to be done it should be either colotomy or extirpation, and the mortality of these will be less than that of partial operations.

Caustic applications are of no use, except in cases where a fungous mass has protruded from the anus. This may at times be removed, with great advantage to the sufferer, by the application of a paste of arsenite of copper mixed with mucilage. The operations for removing a part of the growth with the finger, scoop, or curette may give great relief in the soft varieties of the disease. The sphincter should first be thoroughly dilated, the anus held open with a speculum, and as much of the diseased tissue as possible torn and scraped away. Hæmorrhage, of course, is to be expected, but this is less where the growth is boldly attacked in its deeper parts than when the surgeon is timid and attacks merely the superficial portions, and may be controlled either by plugging the wound with lint and styptics, or by the actual cautery. Allingham relates a case in which he entirely enucleated an immense encephaloid with his hand, with the happiest results.

As for electrolysis in cancerous as well as other strictures of the rectum, all that can be said for it is that with a sufficiently strong current tissue may be destroyed.

CHAPTER XIV.

THE FORMATION AND CLOSURE OF ARTIFICIAL ANUS.

The indications for the performance of laparotomy, with or without the formation of an artificial anus, which are most frequently met in connection with rectal surgery, are :

1. Congenital malformations.
2. Intestinal fistulæ.
3. Severe ulceration of the rectum.
4. Cancer.
5. Intestinal obstruction.

The rules governing the attempt to form an artificial anus in the perineum in cases of congenital malformation have been sufficiently dwelt upon in the chapter devoted to that subject. Failing to find the rectum through the perineum, or, from careful study of the case, deeming it best not to make the attempt, the rule is to form an artificial anus in the left groin.

Attempts at establishing an anus in the anal region after the performance of colotomy are attended with danger and are generally unsuccessful. Perhaps the best authority on this point is embraced in the experience of Mr. Owen.[1] In two cases in which after an interval of three months he attempted to establish an anus in the natural position, the end was a fatal peritonitis due to the fact that the rectal pouch was completely covered with peritoneum. Dr. Byrd[2] has more recently reported a case in which the operation was successful.

Kronlein[3] also reports a successful case. A child six days old had had no evacuation of the bowels since its birth. The anus was extremely narrow and ended in a pouch 2.5 cm. long. An attempt to reach the rectum by an incision through this pouch resulted only in opening the peritoneum, as was shown

[1] "Surgery of Childhood," Brit. Med. Jour., February 21st, 28th, March 6th, 1880.

[2] "Lumbo-Colotomy in the New-Born for Relief of Imperforate Rectum." Read before the Tri-State Med. Soc., St. Louis, October 25th, 1881. (Reprint.)

[3] Berlin Klin. Woch., 1879, Nos. 34 and 35.

by a free discharge of peritoneal fluid. The bowel was then opened in the left groin, and the child lived and thrived. When the child had reached the age of seven months, the rectal pouch could be distinguished, and the original operation was again attempted and the rectal pouch successfully united with the lower one. At the close of the report a stricture existed at the place of union, but the larger part of the fæces were already evacuated by the perineal opening.

The attempt to re-establish an anus in the anal region originated with Demarquay, and involves, if it be successful, a subsequent attempt to close the artificial opening in the groin.

Recto-vesical fistula, when not due to malignant disease, may be curable by local operation, but communication between the bladder and the intestine at any point, whether cancerous or inflammatory, is best treated by colotomy. Cripps,[1] by his study of sixty-three cases, has found the proportion of inflammatory to cancerous to be forty-five to nine—figures which greatly improve the prognosis if colotomy be performed.

In these cases it is of the utmost importance to determine as nearly as possible the location of the opening in the bowel before the operation, lest a left inguinal colotomy should chance to give an artificial anus below the point of communication; and here again Cripps's monograph furnishes the only available statistics. In sixty-three cases the communication was with the rectum in twenty-five; colon in fifteen; small intestine in twelve; unascertained in six.

The rectum was the part implicated in nearly half the cases, and generally at its middle portion. The colon was involved in fifteen cases, and in eleven of these the communication was with the sigmoid flexure. "From these statistics two facts of great importance are established: the one, that communications with the large bowel are about twice as common as those with the small bowel; the other, that in all the cases of communication with the larger intestine the opening existed either between the rectum and bladder or between the sigmoid flexure and the bladder, so that every one of them would have been relieved by a left lumbar colotomy. The practical importance of this cannot be overrated, for it gives a decided answer to the question, On which side shall colotomy be performed? Indeed, there is not a single case amongst the whole number in which there would have been any advantage in opening the right rather than the left colon. The small intestine alone was

[1] "The Passage of Air and Fæces from the Urethra." J. & A. Churchill, 1888.

involved in twelve cases only, while in five cases there was a double communication in both the large and small bowel."

With our present knowledge it is not always possible to decide whether the opening is in the large or small bowel in any individual case. There are two points on which the answer may depend. When by thorough examination, with an anæsthetic if necessary, disease is found by rectal examination, it is fair to assume that the opening is in the immediate vicinity of the disease found. Help may also be furnished by examination of the food passed by the urethra. If it be ill-digested, the fact points to an opening in the small intestine, more especially if the evacuations by the rectum consist of thoroughly digested material.

If fragments of perfectly formed fæces are passed with the urine, the inference is that the opening is in the rectum or sigmoid flexure; and the same inference may be reached from the fact that no fæcal matter finds its way into the bladder when the patient is constipated, but only when the bowels are loose.

In these cases, then, left inguinal colotomy is strongly indicated; the only substitutes for it being cystotomy or laparotomy with the hope of closing the communication, neither of which offers as good a chance of prolonging life.

The cases of *severe, non-malignant ulceration* of the rectum, with or without fistulæ, which are incurable by topical treatment, offer a third indication for the formation of an artificial anus. These ulcers are generally either tubercular, syphilitic, or chancroidal, and many of them are as incurable as though they were cancerous. They are generally, after a certain time, associated with stricture, and the patient is worn out by chronic intestinal obstruction joined to the exhaustion occasioned by the ulceration with its pain and tenesmus. These cases are beyond the reach of cure either by local applications of any sort or by internal medication. Neither acids, scraping, nor burning will do any good after the disease has become of large extent, and the internal use of antisyphilitic remedies is worse than useless. The disease may have been syphilitic at its commencement, but after it has existed for a few years antisyphilitic treatment will not cure it and will consequently exhaust the powers of the patient.

Colotomy in these cases will prolong life indefinitely by relieving obstruction if it exists, and by allowing the rectum to become quiescent by giving another outlet for the fæces. Ulcerations which have resisted all local treatment will heal by

this means; and should they not heal, will cease to exhaust the patient by pain, tenesmus, and loss of sleep.

It is better to admit freely the limitations of our art in these cases, and advocate boldly the only remedial measure in our power, than to go on trying ineffectually to cure old and incurable ulcerations of the rectum by local treatment.

In cancer of the rectum the indications for colotomy are very clear, and there seems to be a growing tendency to earlier operation, though in this surgeons will differ according as they have greater or less faith in certain other palliative measures. Here we have to consider extirpation complete or partial, proctotomy, and electrolysis, as well as colotomy, and to judge between them all which is best.

A safe rule may, I think, be formulated thus: Cases of cancer which are unsuitable for extirpation should be submitted to colotomy as soon as the symptoms of stricture become well marked. Had we any proof that colotomy done still earlier than this would prolong life by retarding the growth of the cancer, as I believe to be the case, the rule would be still further modified to the point of operating on all cases unsuitable for extirpation as soon as the diagnosis was made; and there are some facts which indicate that this will soon be accepted as the proper line of practice. The result of my own study and experience is tending more and more to convince me of the advantages of early operation as the best treatment for all cancers of the rectum, except in the few cases which can be completely extirpated early in their growth.

In delaying operation till the signs of stricture become well marked, a life may be lost. In stricture high up in the rectum, fatal obstruction may be almost the first sign of the stricture. My own experience makes me cautious in advising delay, unless the disease is well within reach of the finger, so that the extent of the contraction can be clearly appreciated. In one of my cases no diagnosis was made till after fatal obstruction led to an autopsy, the disease being a small annular cancer in the sigmoid flexure. In another, in which the diagnosis was clear and the disease extended far up the rectum, the patient died of obstruction while we were trying to arrange a convenient time for a colotomy.

I have myself been an advocate of almost any line of treatment in these cases in preference to colotomy, for the natural objections to this procedure have been very great in my own mind. I have therefore done more proctotomies and excisions

than colotomies, and have fought acute and chronic obstruction from this disease with medical rather than surgical means, often with success that compared favorably with that of colotomy. I have warded off threatened fatal obstruction again and again by means other than colotomy, till the patient has finally succumbed to either exhaustion, generalization of the disease, or an intercurrent affection; and have in such cases felt that I had avoided a deformity which I naturally shrank from inflicting. But this prejudice has passed away, as it becomes more and more evident how comfortable a patient may be after colotomy, how little annoyance the artificial opening may cause, and to what an extent life may be prolonged ; and I now advise and practise the operation much more frequently than formerly, simply because I better appreciate the good it may do.

Proctotomy, dilatation, electrolysis (by electrolysis I mean destruction of the growth, not absorption) are all means of great value in preventing obstruction in cancer; but none of them prevent the exhaustion which comes from the perpetual irritation of fæces at the disease. Colotomy does both, with no more danger and much more efficiently.

I cannot but think that the objections to this operation in the minds of the laity, as well as many of the profession, are more æsthetical than practical and should be discouraged. Colotomy is not a pleasant idea, but the idea is worse than the fact, and, whether pleasant or not, it is the duty of the surgeon to prolong life as long as possible.

The only other cases, directly connected with the rectum, in which it may be necessary to create an artificial anus, are those of acute or chronic intestinal obstruction depending upon pressure by tumors or upon the constriction caused by bands or masses of plastic exudation in the pelvis.

In the formation of an artificial anus the left groin should be chosen for the site of the operation. The colon may be opened either in the loin or groin, and on either the left or right side. There is some uncertainty in the early history of colotomy, and some ambiguity of terms which is apt to mislead. The idea of an artificial anus was first proposed by Littre[1] in 1710, and the incision he recommended was simply "*au ventre*" (in the abdomen); the design being to reach the sigmoid flexure. He never practised the operation which at present passes under his name—that of opening the bowel in the groin—but the operation he proposed did not involve the idea of preserving the

[1] "Histoire de l'Acad. Roy. des Sci. de Paris," 1710, p. 36.

peritoneum intact, and to this point the surgery of the present day has returned.

About the year 1770 Pillore, of Rouen, actually performed the first operation of this nature by making an opening into the cæcum in a case of cancer of the rectum which caused complete obstruction. The patient survived twenty-eight days, and death was not due to the operation. In 1783 Dubois operated in the same way for imperforate anus, but the operation was unsuccessful and the child died on the tenth day. In 1793 Duret, of Brest, opened the sigmoid flexure of a child two days old, and this child lived to adult age. In 1794 Desault practised the same operation without success, and in 1797 Fine, of Geneva, made an artificial anus in the arch of the colon for cancer of the upper part of the rectum, which was also successful, the woman living three months and a half.[1] In 1814 the operation was successfully performed for cancer of the rectum by Martland;[2] in 1817 by Freer, of Birmingham;[3] and in 1820 by Pring.[4] In many of these cases the original operation of Littre was modified to suit the operator; but in none of them was any attention paid to wounding the peritoneum.

An undue prominence seems to attach to the name of Callisen in connection with the operation in the left loin. There was nothing original in his choice of location, nor did he bring out the idea of operating without wounding the peritoneum. He believed that the intestine could be more easily reached from this point than any other, in which he certainly was in error; and on the whole he condemned the operation in the following words:[5] "The incision of the cæcum and descending colon, *which has been proposed*, in this state of things (imperforate rectum), by means of an incision in the left lumbar region at the border of the quadratus lumborum, to establish an artificial anus, presents a very uncertain chance, and the life of the little patient can scarcely be saved; nevertheless the intestine may be reached more easily in this place than above in the iliac region."

It is in reality to Amussat that the extraperitoneal operation

[1] "Manuel de méd. prat. de Louis Adier de Genève," 2d edit., 1811. Quoted by Carcopino, Thèse No. 197, 1879. "Parallel entre l'extirpation du rectum et l'établissement de l'anus artificiel."

[2] Edinburgh Med. and Surg. Jour., October, 1825, p. 271.

[3] Carcopino. Thèse.

[4] London Med. and Physical Journal, 1821.

[5] "Systema Chirurgiæ hodiernæ," t. i. Haffiniæ, 1813.

in the loin is due, and the operation which he described [1] is the one that until recently has been most in favor and the one usually spoken of as that of Callisen—lumbar colotomy, or the operation of Amussat.

Lumbar Colotomy.—Against the operation of lumbar colotomy there have always been several serious objections. It is a difficult operation to perform, and as usually done involves a great risk of opening some part of the alimentary canal not intended. The ground on which it was advocated, that by it the colon could be reached behind the peritoneum, was often false, for the peritoneum was frequently wounded in the attempt to reach the gut. The anus thus formed was awkwardly placed for the patient, so that he could exercise but little care over it without assistance. The operation of closing the fæcal fistula thus formed was a very difficult one. In children the loin operation presented still greater difficulties, for the undeveloped state of the colon renders it much more difficult to find than in adults, it presents many variations in position, and the relatively large size of the kidney greatly decreases the space in which the operator is obliged to search. In the child, too, the descending colon is almost completely surrounded by peritoneum. In fact, the lumbar operation owed its popularity entirely to the false dread which so long existed against incising the peritoneum. This dread, and the surgery based upon it, have fortunately become things of the past.

Nevertheless the lumbar operation is applicable to cases of disease of the sigmoid flexure and of the colon in which the inguinal incision would be below the disease, and for this reason it will never pass entirely out of practice.

The guide to the descending colon is the outer border of the quadratus lumborum muscle, and the guide to the outer border of the muscle is a perpendicular from a point half an inch posterior to the middle of the crest of the ilium, or to a point half an inch posterior to the middle of a line drawn from the anterior superior to the posterior superior spinous process. This point should first of all be accurately determined and marked with ink or iodine, for the edge of the muscle cannot easily be felt in many subjects. The descending colon is here sometimes uncovered by peritoneum to a considerable extent, being behind that membrane and in immediate contact with the transversalis fascia. The patient should be placed upon a hard pillow, so

[1] "Quelques Réflexions pratiques sur les Rétrécissements du Rectum," Gaz. Méd. de Paris, 1839, No. 1.

that the loin may be brought into prominence, and the operator should stand at the back of the patient.

The incision should cross the edge of the quadratus obliquely from above downward and from behind forward, beginning at the left of the spine below the last rib, and extending four or five inches. In this way the middle of the outer border of the muscle will correspond to the middle of the incision, and the large branches of the spinal nerves will not be severed. The incision is then carried carefully down, layer by layer, through the latissimus dorsi, external and internal oblique, and transversalis muscles, till the outer border of the quadratus is recognized; care being taken that as the incision grows deeper it does not also grow shorter, till when the bowel is reached the operator finds himself working in the small end of the funnel. If

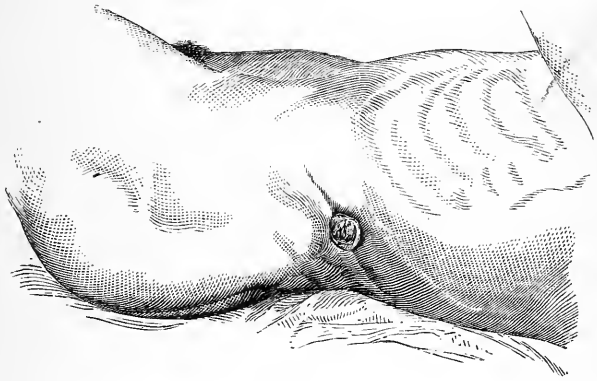

Fig. 141.—Lumbar Colotomy.

possible the outer border of the quadratus should be distinctly recognized before the transversalis fascia is divided, under which lies the colon more or less enveloped in fat. This incision should not be more than three inches in length, for by limiting it to this extent the operator is in a manner compelled to come down upon the point required at which the colon is most likely to be reached, and great weakening in the abdominal wall and consequent prolapse are avoided, and considerable sphincteric power may be gained.

Having reached the gut, great care must be used in selecting the piece to be opened, for it is an easy matter to incise the duodenum instead of the colon. No piece of intestine should be opened till the longitudinal bands in it have been clearly recognized. If this can be done to the operator's satisfaction

without wounding the peritoneum, so much the better, but otherwise it is much safer to incise the serous membrane, pass the hand into the abdomen, and make sure that the colon and not the small intestine is being operated upon. This should, I think, be the general rule in the operation, for in most cases it is very difficult to make sure of the longitudinal bands before the peritoneum has been opened.

In a certain proportion of cases the ascending and descending colon will be found destitute of mesentery, and hence uncovered by peritoneum for a portion of the posterior wall, as shown in Fig. 142. This proportion is given differently by different investigators. Treves places it at seventy-four in one hundred cases on the right side and sixty-four in one hundred on the left. Allingham, Jr.,[1] finds it to be eleven out of sixty on the right and ten out of sixty on the left. Combining the results of the two sets of dissections, we have eighteen and one-

FIG. 142.—Colon without Mesentery. (Allingham.)

third out of one hundred on the right side, and sixteen and two-thirds out of one hundred on the left, or a much smaller proportion than has generally been supposed. In other words, in only about seventeen cases in one hundred can either the ascending or descending colon be opened without first incising the peritoneum.

In a certain other proportion of cases represented by Fig. 143, the ascending and descending colon have a short mesentery, or, in other words, are completely covered by peritoneum, so that they can neither be seen nor reached without opening the peritoneal cavity. This proportion, according to the same authorities, is eighty-one and two-third cases in one hundred on the right side, and eighty-three and one-third in one hundred on the left. In still another set of cases represented by Fig. 144 there is a long mesentery, allowing of free motion of the colon from one

[1] British Medical Journal, April 28th, 1888.

side of the spine to the other. These cases show how impossible it may be to reach the bowel without incising the peritoneum and introducing the hand into the abdomen.

When the gut has been found it should be stitched to the edge of the skin by sutures passing through the serous and muscular coats before opening the bowel. These should be about a quarter of an inch apart. It is better to delay opening the bowel for

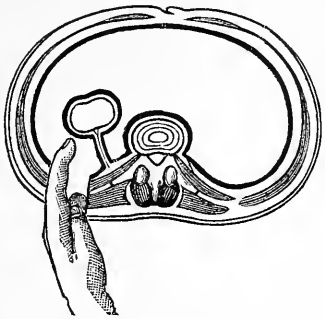

Fig. 143.—Colon with short Mesentery. (Allingham.)

at least forty-eight hours, unless the obstruction is so severe as to render the opposite course necessary.

It is of great importance in this as in inguinal colotomy to make so sharp a spur in the posterior wall as to prevent the passage of fæces into the distal end past the artificial anus. If

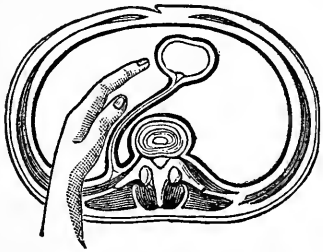

Fig. 144.—Colon with long Mesentery. (Allingham.)

the bowel can be drawn well out of the wound, this may be accomplished by passing a suture underneath it, drawing it tight, and securing it to the edges of the incision. The suture may be passed through the mesentery close under the bowel, if the mesentery can be reached; otherwise it may be passed through the muscular coat of the gut. Failing to do this, the bowel should be drawn well out of the wound, so that in the undistended gut

at least two-thirds of its calibre shall be outside of the line of sutures. In this way a sharp bend and a good spur are secured.

Inguinal Colotomy.—The operation in the left groin is to be preferred in all cases except those mentioned where the disease is in or above the sigmoid flexure. It is attended by no greater danger than the lumbar operation, and in other respects has many advantages. It is easier of performance; the anus is so situated that the patient can better care for it and secure cleanliness; it is more easily closed by a subsequent operation; it allows the terminal portion of the gut to be more easily cleared of any fæcal matter which may collect in it; and it permits of attempts to establish an anus in the perineum in those cases in which the operation has been performed for imperforate anus in children. This operation permits also of considerable choice in the part of the sigmoid flexure to be opened. The opening may be made low down toward the rectum or high up toward the colon —so high that only a few inches of the gut shall intervene between the opening in the groin and the place that would be occupied by one in the loin. (Fig. 145.)

The operation in the right instead of the left groin has been advocated to meet the frequently found abnormality in the position of the flexure in children. It is well known that in them the flexure is relatively much longer and much more loosely attached by its mesentery than in adults. In one hundred and thirty-four autopsies on children of less than two weeks of age, Giraldis found the sigmoid flexure on the left side in one hundred and fourteen; Curling[1] in one hundred found it so located in eighty-five; and Bourcart in one hundred and seventeen out of one hundred and fifty.[2] It would seem from this that the abnormality is not sufficiently frequent to indicate a change in the site of the incision, especially when the ease with which the flexure can be found and brought to the surface, no matter in what part of the pelvis it may be, by the incision in the left groin, is considered.

In performing this operation, as in all laparotomies, it is unnecessary to say the strictest antisepsis should be observed. The wall of the abdomen should be scrubbed with soap and a stiff brush, and then carefully shaved together with the symphysis. After all loose hairs have been wiped away the parts should be again washed with ether, and subsequently with bichloride, 1 : 1000. The abdomen should next be covered with

[1] Op. cit., p. 230.

[2] Guyon: "Dict. Enc. des Sci. Méd.," Paris, 1863.

towels wet in warm bichloride solution, 1 : 3000, till only an opening five or six inches long and three or four wide is left for the incision.

The incision which I have adopted, and which gives perfect satisfaction, is the one advised by Cripps. (Fig. 145.) An imaginary line is drawn from the anterior superior spine to the umbilicus. An incision two and a half or three inches long is made to cross this at a distance of an inch or more from the spine. Drawing the skin tense towards the median line, as he recommends, till the transversalis fascia is exposed, is a very useful point, for by so doing the opening is made somewhat valvular, thus aiding in sphincteric power. Before opening the

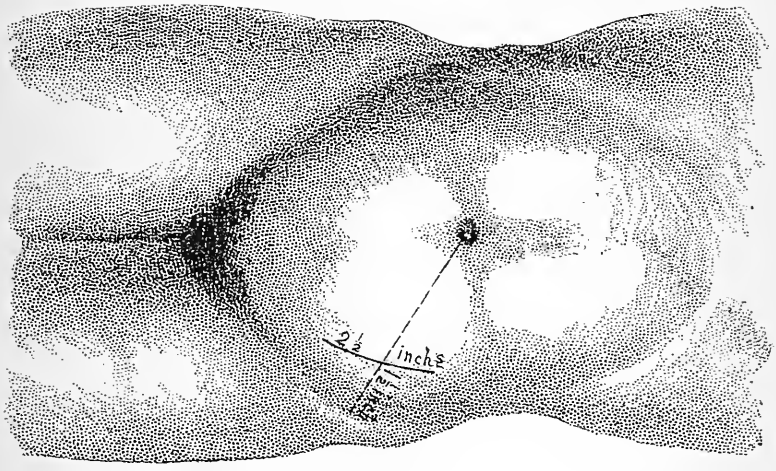

Fig. 145.

peritoneum on the director, all oozing from the cut surfaces should be dried by pressure with a towel.

Immediately on dividing the peritoneum the finger of the right hand, first carefully cleansed, is passed into the abdomen and the first presenting coil of gut is drawn out. In many cases this will prove to be the sigmoid flexure, and can easily be recognized by the longitudinal bands of muscle and the *appendices epiploicæ*. Should it prove to be small intestine, it is slipped back and the finger passed more deeply into the pelvis for another loop. Any mistake in opening small for large bowel in this location seems to be entirely unnecessary, and, in fact, but little trouble is experienced in bringing the large bowel to the surface at once, even if it does not crowd itself out through the wound.

Cripps suggests passing two provisional sutures through the bowel at this stage of the operation, to act as leaders and subsequently serve as a guide for opening the gut. (Figs. 146, 147.)

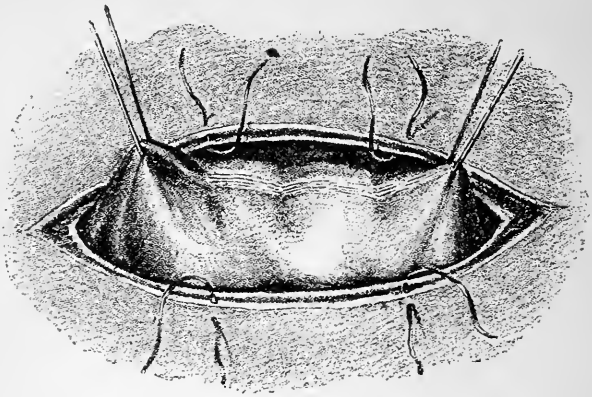

Fig. 146.—(Cripps.)

I prefer, however, to at once pass a long harelip pin under the gut in the following way. (Fig. 148.) Entering it through the skin on one side a quarter of an inch from the edge and at

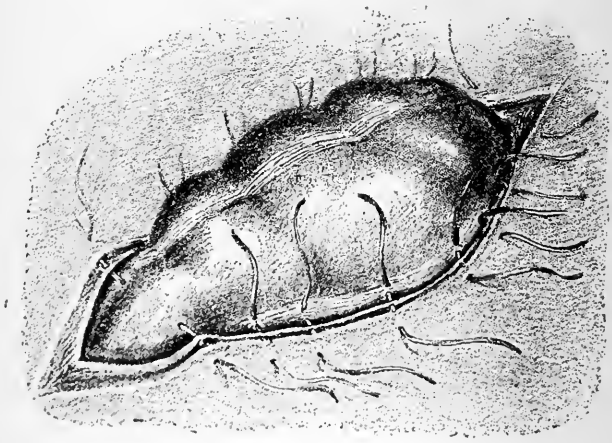

Fig. 147.—(Cripps.)

about the junction of the middle and lower thirds of the wound, it is next passed through the peritoneum on the same side, then through the mesentery of the gut at a correspondingly low point

of the exposed coil, then through the peritoneum of the opposite side, and finally through the skin again. In this way a very sharp spur is formed and the gut is so securely fastened in the wound that there is no possibility of its becoming detached.

The gut is next stitched to the skin with half a dozen sutures of black thread on each side and one in each angle. The needle used should be round and half-curved. The suture should include first the edge of the skin, then the visceral layer of peritoneum, then the serous and muscular layers of the gut, and should be tied and the ends cut short. About fourteen of these will completely shut off the cavity of the abdomen so that the gut may be opened at once, should the severity of the symptoms render it necessary. When the suturing is completed about two-thirds of the calibre of the gut should be outside the line of sutures.

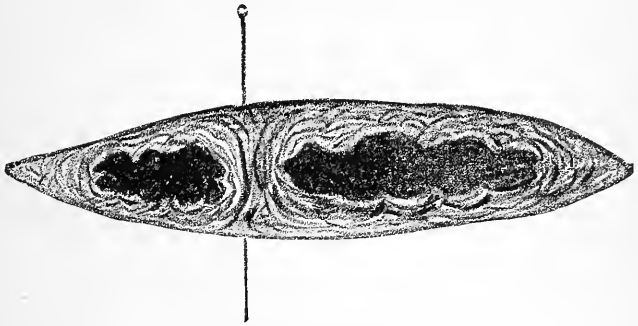

FIG. 148.—Harelip Pin in Colotomy.

If possible, it is better to postpone opening the bowel for a couple of days at least, and cover the wound first with protective, then with a pad over the gut, and on this bichloride gauze, cotton, and an obstetrical bandage. The protective next the gut is important, as it prevents the matting together of all the parts and dressings by the free effusion of lymph. Even a few hours are sufficient to give union of the serous surfaces by effusion, however, sufficient to prevent oozing into the peritoneal cavity, and I seldom care to wait longer than the end of the third day, being ready to open the gut much sooner should it seem advisable. Slight scarification of the peritoneal surfaces with a needle before joining them with the sutures will promote more rapid union.

The gut is opened by piercing it with a sharp-pointed bistoury, introducing a fine pair of toothed forceps, seizing the edge, and excising a considerable piece with scissors, paring

the bowel well down to the line of sutures. This procedure is not attended by any pain, and ether is unnecessary.

When the bowel has been opened the appearance of a double-barrelled gun shown in Fig. 149, with the lower orifice smaller than the upper, becomes evident.

The sutures may be left to find their own way out, but the pin should be taken out as soon as union is secure. The opening is dressed merely with a piece of sheet lint and vaseline, and pad and bandage. By the end of the tenth day the patient is generally up and about, and is convalescent in two or three weeks. In a case recently operated upon in the height of acute obstruction with incipient general peritonitis, the bowels were

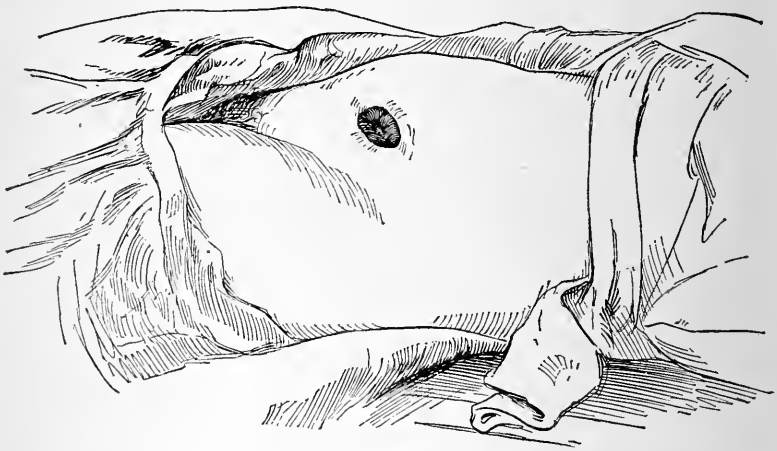

Fig. 149.—Opening in Inguinal Colotomy.

working naturally twice a day at the end of the second week, and the patient walked into my office, much to my surprise, on the seventeenth day.

I have had one patient, operated upon for intestino-vesical fistula of cancerous origin, leave the hospital for his home, a hundred miles away, on the fourteenth day.

In the after-treatment of the opening I have found nothing much better than a dressing of greased sheet lint, a pad of cotton, and a wide elastic bandage. I generally have a truss, exactly similar to the ordinary truss for hernia, with a hard-rubber bulb to fit the opening, made for each case; but most of the cases make little use of it, and are perfectly comfortable without the increased pressure it affords.

With regard to this operation there are a few general considerations which are worthy of notice.

It is not in itself a dangerous operation when performed as here described and before the patient has become exhausted by obstruction. When done early, as soon as the symptoms of stricture are manifest, the danger of peritonitis is very slight and the mortality correspondingly small; but when delayed till the patient is at the point of death, the mortality reaches to thirty or forty per cent.

I recently operated on an old gentleman on his eighty-first birthday. The case had been seen six months before, and the family told that "eventually" a colotomy would be necessary. When I operated he was in a very feeble condition, and the propriety of the attempt to prolong life was left entirely to the decision of his physician, his family, and himself. The operation was completed in exactly seventeen minutes, and, though attended by the least possible amount of shock, the patient very nearly passed away on the table. He lived, however, till the gut had been opened forty-eight hours after, and two large fæcal evacuations had taken place through the artificial anus twelve hours later, and then sank quietly and died on the third day. All that can be said of such a case is that an attempt to prolong life and end suffering failed—not that the operation in any way hastened the end.

The operation should be regarded not as a last resort, to be performed at the very close of life and perhaps after fatal obstruction has set in, but as a measure calculated, when used early, to delay the course of malignant disease and to add years of comfortable life to the patient; while in non-malignant disease it is often curative.

In cases of intestinal obstruction the surgeon has his choice between laparotomy and enterostomy, and the choice must be made with great care. Opening the abdomen, finding and relieving the cause of the obstruction, be it band, diverticulum, concealed hernia, or invagination, would certainly seem better surgery than to open the first presenting distended coil of intestine, with the probability that it may be above the disease, and the hope that the cause of obstruction may take care of itself, and leaving the abdomen without a search. And yet, as Curtis[1] has shown, much to the surprise of the profession at large, the

[1] "The Results of Laparotomy for Acute Intestinal Obstruction," Trans. Med. Soc. State of New York, 1888; and "Enterostomy for Acute Intestinal Obstruction," Med. Rec., September 1st, 1888.

choice between the two operations may depend entirely on the strength and general condition of the patient. After studying both operations carefully he reaches the following conclusions: "1. The mortality for laparotomy is 68.9 per cent; the mortality for enterostomy is 48.7 per cent. 2. In enterostomy 4.8 per cent of the sixty-two cases died because the operation did not relieve the constriction; but even in laparotomy 5.8 per cent of the three hundred and twenty-eight cases died from the same cause. 3. Enterostomy restores the natural passage for the fæces in 60 per cent of the cases which recovered; while even laparotomy preserves it in only 79 per cent of the recoveries. 4. Laparotomy is therefore so very little better than enterostomy that, in consideration of its greatly increased risk, it is indicated only when the patient's condition is so good that he can bear the shock, and when the intestines are not so greatly distended as to offer a serious obstacle to a thorough exploration of the abdomen. 5. Under all other circumstances enterostomy should be performed, and, if necessary, this can be done without an anæsthetic. Laparotomy may be resorted to later to remove the cause of obstruction and to close the artificial anus. 6. Whichever operation may be chosen, it is necessary to operate early, for every delay greatly increases the risk of failure."

In doing an enterostomy under these circumstances the incision should be the same as that for left inguinal colotomy, and the parietal peritoneum should be stitched to the skin in the same manner. The first presenting distended loop of gut is then fastened into the opening very much as described in that operation. The operation is more difficult, however, than a simple inguinal colotomy, for the loop of gut may be the size of the arm and may protrude, if there be much abdominal distention, in a manner which will add greatly to the difficulty. It must be handled as gently as possible, and kept in place by soft towels wet in warm antiseptic solution till the sutures are passed. A considerable section of the distended gut should be outside of the wound when the operation is completed—a piece at least an inch and a half long by the same in breadth—and only a few hours at the most may be allowed to elapse before the gut is incised and the edges pared down to the skin.

In laparotomy for obstruction the site of the incision has first to be decided. The rule is to make the incision as near as possible over the cause of obstruction when, as in cases of tumor, this can be located, and in all others to cut in the median line.

Weir[1] has discussed at length the relative advantages of a short incision, such as is used in ordinary ovariotomy—from two and a half to five inches long below the umbilicus—and a free laying open of the abdomen by a cut from seven to twelve inches in length. The objections to the short incision are that by it, unless the seat of difficulty be very apparent, it cannot be found without a prolonged search, which is often disastrous to the patient. An incision large enough to admit even the whole hand, as Weir points out, only allows the operator to use the sense of touch, and in a case of obstruction this is particularly unsatisfactory and often deceptive; while a larger incision past the umbilicus permits both sight and touch and may save much time in unavailing search. The proper rule is by a short incision below the umbilicus to search for the most common causes of obstruction in the neighborhood of the cæcum and the hernial openings, and, failing to find the disease, to enlarge this cut upward past the umbilicus till the intestines may be fully drawn out through it and all parts of the abdomen inspected. The time consumed in a laparotomy is one of the chief factors in its result, and is much more important than the length of the incision, while the free exposure of the abdominal contents in the search for the obstruction is likely to do less harm than a prolonged search with the hand in the dark.

The old rule for finding the obstructed point in the bowel was to begin at the cæcum, and if this was found distended to search toward the rectum, but if undistended to search toward the stomach, for it is plain that the distended gut lies above the obstruction. In the former case the search was short; in the latter a coil of undistended gut was selected as a starting point and traced upward inch by inch to the obstruction. This course, as again shown by Weir, is full of uncertainties. In the first place, it is no easy matter to decide whether the colon is or is not distended as a starting point; and in the second, it is impossible to tell, after starting with a loop of undistended small bowel, whether it is being followed upward or downward, toward or away from the obstruction. According to Rand[2] the first point of small intestine which presents is to be drawn out of the wound and held taut. The hand is then to be passed backward to the spine, guided by the mesentery. If the bowel is held in its true direction, the hand passed down on the right of it will be guided

[1] "On the Technique of the Operations for the Relief of Intestinal Obstruction," Med. Record, February 11th, 1888.

[2] Br. Med. Jour., December 22d, 1883.

by the mesentery to the right side of the spine, and can be passed up and down along the right side of the mesenteric attachment at the vertebra. But should the upper end, as held by the operator, be in reality the lower end—in other words, should the piece be held in the wrong direction—the hand passed to the right of it will follow the twist of the mesentery to the left side of the spine, and *vice versa*. This rule, though anatomically correct, is also of little use in practice, and the operator may easily spend many minutes of valuable time in tracing the undistended gut in the wrong direction, only to find himself at last at the stomach instead of the cæcum, and under the necessity of retracing his steps.

Under all the circumstances, therefore, if the obstruction be not manifest after a short search through a small incision, it is better to enlarge the cut, turn the gut out of the wound first on one side and then on the other, and find the seat of disease, whether it be in the intestine itself or in the abdomen. In this way only can a thorough search be made and the necessity for puncturing or incising the gut to diminish its size obviated.

In handling the gut it should be covered with a soft towel wet in warm salicylic acid solution 1:1000, and exposed as little as possible. If it be kept out of the abdomen for any length of time, the towel should be changed every few minutes and the gut gently irrigated with the same solution. In replacing the intestine, if difficulty be experienced, the simple device practised by Czerny, of enclosing the mass in a towel and tucking the edges into the abdomen while the first sutures are introduced, is a great help. As the wound is gradually shortened from above downward, the towel may be drawn down and out. The sutures should include the whole thickness of the abdominal wall, with the peritoneum if possible; but, as Weir has shown, the peritoneal edges may not be accurately approximated, as the coils of the intestine come in contact with the incision and after a few hours shut it off from the general peritoneal cavity by adhesions.

In all cases of obstruction, no matter what the variety, if after laparotomy it is found impossible to remove the cause, the rule is to form an artificial anus and leave the question of resection to a future date. Resection in the midst of obstruction is an almost fatal operation, while secondary resection and closure of an artificial anus give a much better chance for the patient.

In cases of cancer of the upper part of the rectum or descend-

ing colon, the operation of resection may be followed by the establishment of an artificial anus with both ends of the gut in the wound, by a circular enterorrhaphy, or the establishment of an intestinal anastomosis.

If the patient's condition permit, there is no objection to completing the whole operation at one time by the establishment of an intestinal anastomosis, provided the colon above can be drawn down to the rectum; but on account of the amount of tissue removed it may be impossible to do this, or even to attach both ends to the wound.

The incision may be made over the disease. If this be in the sigmoid flexure, it may be either parallel with Poupart's ligament or extend from the umbilicus to Poupart's ligament.

Enterorrhaphy.—The loop of intestine to be operated upon should be drawn well out of the abdominal wound, and a flat sponge, previously carbolized or soaked in warm Thiersch[1] solution, placed in the abdomen under the incision to keep back the coils of small intestine and prevent any contamination of the abdominal cavity by blood or fæces. While the exposed gut is covered with warm antiseptic towels, pieces of tape a quarter of an inch wide, carefully prepared by previous soaking in bichloride, should be tied above and below the part to be excised. The gut should then be cut across at right angles to its axis, and a triangular piece of mesentery to correspond excised as shown in Fig. 150. The bleeding mesenteric vessels should be tied with catgut, and the contents of the gut thoroughly pressed out between the tapes. The divided ends of the gut should next be thoroughly washed with antiseptic solution.

The object of excising a triangular piece of mesentery to correspond with the excised piece of gut is to prevent kinking and strangulation of the gut after union has occurred.

The edges of divided mesentery are first to be united with catgut sutures about a quarter of an inch apart from each other, and the edges of the gut at the mesenteric attachment should be carefully approximated at the same time.

In suturing the gut, Wyeth, in his successful case, employed three sets of sutures. 1. A suture through the mucous membrane alone, or Czerny's suture. 2. One through the peritoneal coat alone, or Lembert's suture. 3. One piercing the peritoneal coat and passing along with the muscular layer, coming out on the free divided edge of the gut, which he calls the intermediate suture.

[1] Thiersch solution: Boric acid, gr. iv.; salicylic acid, gr. i.; water, ℥ i.

When the gut is cut across, the muscular layer retracts, carrying the peritoneal with it and leaving the mucous to project about an eighth of an inch. The Czerny suture unites the mucous membrane and the submucous connective tissue, and is

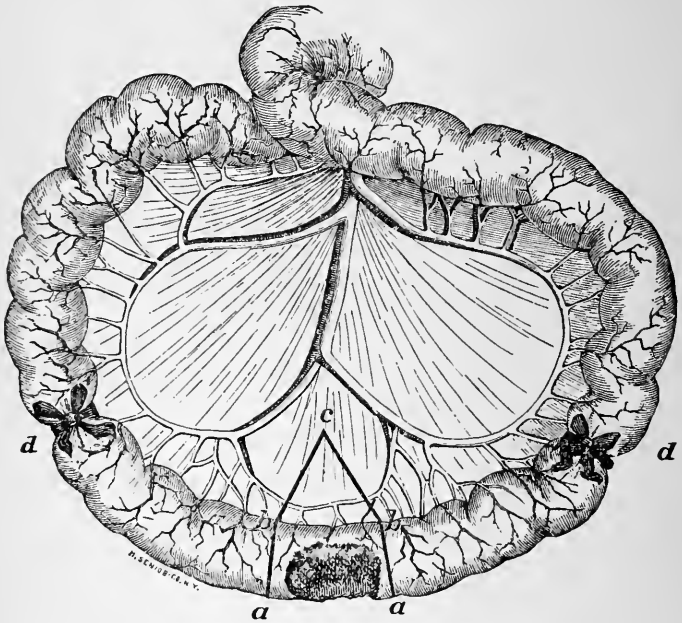

Fig. 150.—Resection of Intestine. (Wyeth.)

inserted as is shown in Fig. 151. It gives great additional strength to the union of the cut surfaces. The Lembert suture,

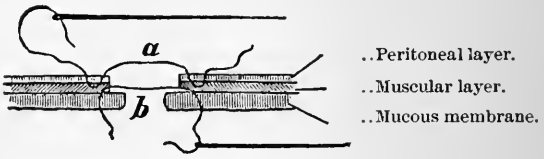

Fig. 151.—Schematic. *a*, Lembert's, and *b*, Czerny's sutures. (Wyeth.)

shown in the same figure, unites the peritoneal surfaces, passing only slightly into the muscular layer. Fig. 152 shows the result of passing and tying these two sets of sutures, the free edges of the mucous membrane being turned inward and the knot of the Czerny suture remaining within the lumen of the gut. The

intermediate suture is shown in Fig. 153 with the others. It is used merely to strengthen the line of union.

In suturing the gut a round, fine, straight needle should be used, threaded with fine, black, iron-dyed silk, and kept in a 1 : 3000 sublimate solution. For passing the sutures Wyeth gives the following rule: "In commencing the sutures, first insert one Czerny suture just over the mesenteric or attached border of the intestine, and tie this, the knot, of course, coming within the lumen of the gut. The needle should pass from within through the mucous layer at a distance of about three-

Fig. 152.—Schematic. Showing the inversion of the peritoneal layer by tying Lembert's suture, and of the mucous membrane by Czerny's suture. (Wyeth.)

sixteenths of an inch from the free border, out along the free border of the same end, and, being carried across to the opposite end, should be made to enter below the muscular and mucous layer, and to emerge through the mucous layer three-sixteenths of an inch from its cut edge. A Lembert suture should be next inserted just at the edge of the mesenteric attachment, as follows: The needle is made to enter the peritoneal coat one-eighth of an inch from the edge, and passing between the serous

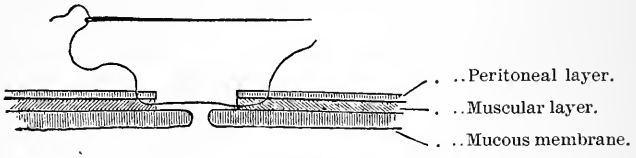

Fig. 153.—Schematic. Showing the route of the intermediate sutures. (Wyeth.)

and muscular coats, is again brought out through the peritoneal layer about one-twenty-fifth of an inch from the edge. At a point exactly opposite, the same stitch is passed through the peritoneal layer of that side for the same distance, and this thread is tied. In knotting all these sutures it is a wise precaution to use the double or friction knot for the first tying, for by so doing there is no danger of the suture slipping and the parts separating as the second turn is being made. A second Lembert suture should now be inserted on the other side of the mesenteric attachment, and an intermediate suture passed

between these, through the substance of the mesentery and down into the strip of intestine, which here is uncovered by peritoneum. *Extra care must be taken to see that this part of each end of the cylinder is in perfect coaptation.* The sutures are now inserted for the remainder of the opposing surfaces. The Lembert and intermediate sutures alternate through the entire circumference, and should be one-eighth of an inch apart. The mucous or Czerny sutures should be from one-fourth to three-eighths of an inch apart. The relative proportion of these sutures is shown in Fig. 154. It is evident that, while the Czerny suture is tied leaving the knot within the cavity of the intestine for the first part of the operation, the last few threads must be tied leaving the knot embedded between the mucous and muscular layers of the wall. In applying the sutures the plan followed was, first a Czerny, then a Lembert about over this, next an intermediate, another Lembert, and after this a

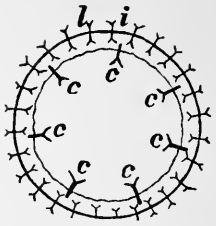

FIG. 154.—Schematic. Section of intestine, showing the proportion of each form of suture, and their distance apart. *l*, Lembert; *i*, intermediate; *c*, Czerny suture. (Natural size.) (Wyeth.)

second Czerny suture, and so on. In other words, it was necessary to insert the mucous suture before the superficial sutures had quite reached that point. All the threads should be cut off close to the knot."

Instead of this elaborate suturing it is much better to use continuous sutures, one to the mucous membrane and two to the gut, for by this means much time may be saved.

The appearance of the gut after the operation is finished is shown in Fig. 155.

In doing this operation time is of the utmost importance, and the operator, if circumstances permit, should familiarize himself with the technique by frequent performance on the cadaver or on live dogs. Wyeth's successful case took four hours in the performance, notwithstanding that he had previously operated ten times on the cadaver.

After completing the line of suture, additional strength and

security may be gained by enwrapping the bowel at the point of union in a piece of wholly or partially detached mesentery, as has been recommended by Kraussold[1] and Senn;[2] and for safety, the line of junction may be fastened by a thread to the abdominal wall near the incision, so that it may be brought at once to light should subsequent symptoms demand it.

Intestinal Anastomosis.—Thanks to the labors of Dr. Senn, many of the operations upon the intestines may now be completed at one sitting, in which it was formerly necessary first to establish an artificial anus, and subsequently submit the patient

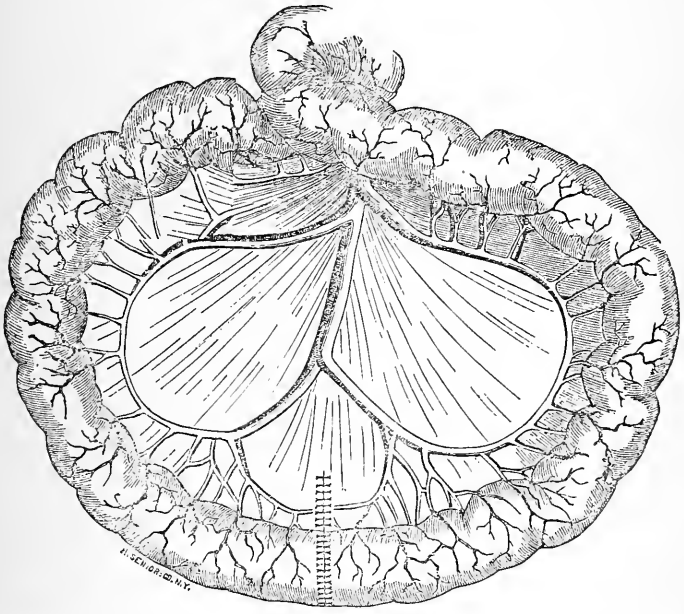

Fig. 155.—Showing the Line of Sutures in the Mesentery and Around the Intestine. (Wyeth.)

to all the dangers of a second laparotomy to close the opening thus made. This applies to many cases of obstruction, to hernia with gangrenous gut, to fæcal fistula, and to resections from any cause. The operation he has devised consists briefly in making an opening in the gut above and below the disease, or in the sides of the two terminal portions after a resection, in approximating these two openings by sutures, and allowing the flow of fæces to establish itself by this new channel. The two

[1] Sammlung Klinischer Vorträge, No. 191, s. 23, 1881.

[2] "Experimental Contribution to Intestinal Surgery," Lancet, October 8th, 1887.

openings are held in apposition by rings introduced into the lumen of the gut—one through each opening. To the rings threads are attached, about six to each ring, and these are threaded and brought through the intestinal wall from within outward about a quarter of an inch from the edge of the incision, which should be longitudinal and at least an inch and a half long. After these have been tied in pairs, and the two openings have been approximated in this way, the adjacent peritoneal surfaces should

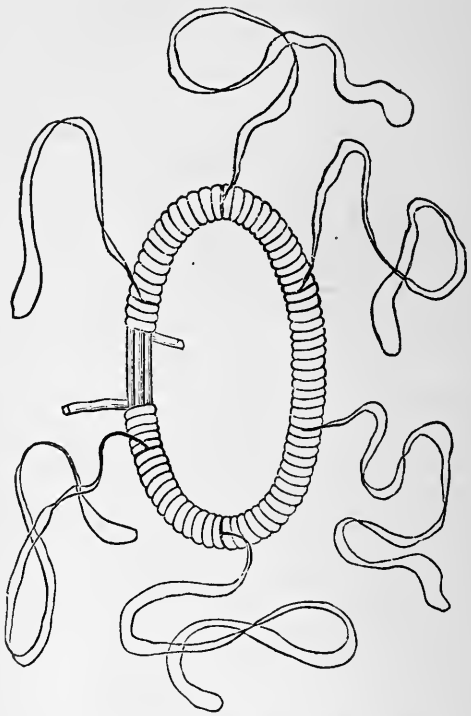

Fig. 156.—Apposition Ring of Catgut. (Abbe.)

be still further secured by a row of sutures entirely surrounding the site of the anastomosis. In Senn's experiments the rings were made of decalcified bone, but a soft-rubber catheter may be cut into sections and strung on catgut, which when absorbed will allow of loosening and evacuation of the rubber, or a ring of catgut such as Abbe has employed (Fig. 156) may be used. Abbe has suggested that after resections the ends should be applied to each other, so as to allow of intestinal paristalsis in the natural direction through the artificial opening; other-

wise a sharp angle has to be turned in the passage of the fæces from the proximal to the distal portion. In resections also the two cut ends should be turned and stitched over by a continuous suture.

If, in spite of the precautions of the operator, the use of flat

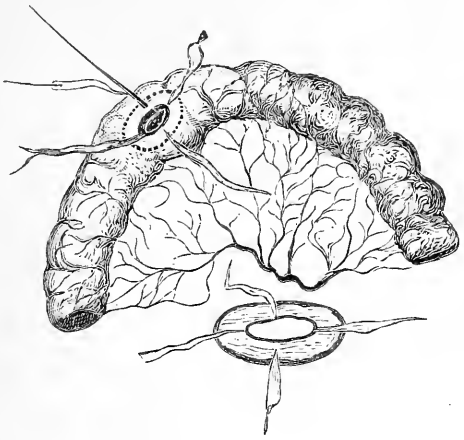

FIG. 157.—(Senn.)

sponges in the abdomen, the torsion of bleeding vessels, closing the lumen of the gut above and below the point to be opened,

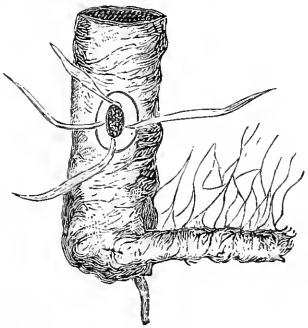

FIG. 158.—(Senn.)

etc., blood or fæces escape into the abdominal cavity, the wound should not be closed till the peritoneum has been washed out either with simple warm water previously boiled or with a solution of salicylic acid 1:1000. Neither bichloride of mercury nor carbolic acid should be used for this purpose. The same must be done should purulent peritonitis be found to exist on

opening the abomen—in fact, when there is any reason to fear that anything septic may remain in the cavity after closing the wound.

FIG. 159.—(Senn.)

Closure of Artificial Anus.—The operation of closing an artificial anus is rather a more difficult and dangerous one than that of forming the opening in the first place.

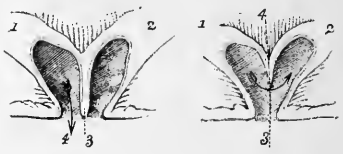

FIG. 160.—Condition of Bowel after Colotomy, showing Septum and course of Fæces. (Packard.)

In the ordinary operation of closing a colotomy opening, the spur, if there be one sufficiently marked to be likely to produce obstruction, must be removed. In the old operation of Dupuy-

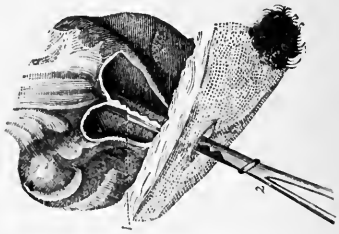

FIG. 161.—Enterotome of Dupuytren in Position. (Packard.)

tren[1] this was done by compressing it with a forceps made for the purpose till a slough was produced. The spur is shown in

[1] "Leçons orales de Clin. Chir.," Paris, 1839.

Fig. 160, and the enterotome of Dupuytren in position in Fig. 161. The spur is composed of the entire thickness of two layers of intestinal wall.

His idea was to apply sufficient pressure at once to cause the complete closure of the blood vessels and subsequent sloughing. He therefore passed one blade into the upper opening, the other into the lower, brought them into contact on each side of the fold, and screwed them tightly together. This is perhaps the most difficult part of the operation. It is not always easy even to find the lower opening through the artificial anus, which is small and liable to be filled up with prolapsed mucous membrane ; and after having introduced this blade of the forceps it is by no means easy to tell exactly what is within the grasp of the instrument when it has been secured. Dupuytren's rule was to determine the course of the two segments, pass one blade into each for an inch or more, and then bring them together. Whatever form of instrument is used, the blades should cover a considerable surface, should fit one into the other to secure the destruction of the tissue, and should be separate to facilitate their introduction. The feeling in more recent times has been in favor of starting with a moderate degree of pressure which will secure adhesive inflammation around the part and shut off the general peritoneal cavity, and, after a few days, to increase the pressure to a point which secures the death of the part. The instrument must be left on till it comes away of itself, usually about a week, and the pressure should be increased from time to time. The instrument will sometimes be very well borne, at others it will excite considerable constitutional disturbance with signs of obstruction, and it may set up fatal peritonitis. It is best, therefore, to attack the spur by successive advances rather than to seize and compress the whole at once.

In some cases this primary destruction of the spur may be dispensed with—cases in which it is of such small size as to offer no considerable obstacle to the passage of fæces beyond the artificial opening. In such the bowel may be closed at once. The closure of the orifice may be accomplished in several different ways. The operation of Malgaigne consisted in dissecting up the edges of the gut without passing beyond the adhesions to the abdominal wall, turning the edges into the lumen of the bowel back to back, and uniting the opposing serous membranes by suture—closing the opening in the skin by a subsequent operation. The operation of Denouvilliers consisted in dissecting up the mucous membrane alone and turning

it into the lumen of the bowel in the same way. Barker[1] has reported an operation, the essential feature of which consists in introducing into the bowel through the artificial anus, after the projecting spur of the bowel has been removed in the usual way, a thin and flexible strip of rubber about one inch and a half long by five-eighths of an inch broad, in such a manner as to lap up against the internal orifice, and to secure this in position by a single wire stitch at each end passed through the abdominal wall. The object is to allow the rubber to remain till the fistula is closed by paring and suturing its edges, and then by cutting the wires to allow it to pass down the bowel. In the case recorded, the rubber answered the purpose of preventing the escape of fæces very perfectly for the first few days, after which there began to be leakage, and it was removed. The fistula, however, went on to complete closure.

Another successful operation is the one performed by Dr. Byrd and described by him as follows :[2]

"The *éperon* was destroyed with an enterotome made of steel wire bent into the shape of a pair of tongs, with the blades having fenestrated openings that more tissue could be enclosed within their bite. This was applied by passing a blade into each end of the bowel about two inches. The spring of the instrument caused sufficient inflammation to secure surrounding adhesions to a certainty, and the pressure being reinforced in three days with a strong India rubber band over the blades, an ulcerative process ensued which caused the *éperon* between the blades to disappear."

"The *éperon* having been destroyed, I operated for the closure of the artificial anus in the following manner: The skin on either side of the opening was caught up in a fold in such a manner that the top of the folds met easily over the opening in the bowel; an incision along the top of these folds, which was about three-quarters of an inch from the opening in the bowel, was then made through the skin and superficial fascia, and extended so as to form an ellipse enclosing the opening. That portion of the skin next the opening was then dissected up from the outer side, leaving it attached at the inner side to the opening in the bowel; it was then inverted and turned into the bowel. This procedure brought the raw surfaces in apposition,

[1] Lancet, December 18th, 1880.

[2] "Excisions of Portions of the Alimentary Canal covered by Peritoneum," by William A. Byrd, M.D., Quincy, Ill. Reprint from Transactions of the American Medical Association.

and threw skin into the bowel so as to form a continuation of the mucous membrane. The skin on either side of this elliptical raw surface was now brought together by passing two stay sutures, with a shot and shield, back about an inch from the cut edges, and making traction. This brought the edges to-

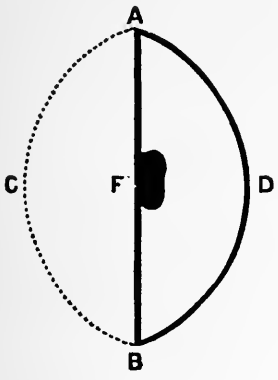

FIG. 162.

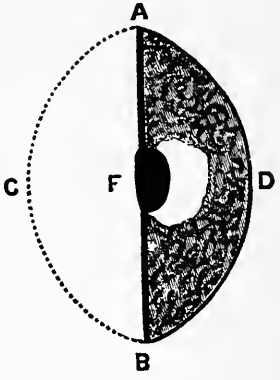

FIG. 163.

gether and made them rise from the abdomen like an inverted V. Where the skin met at the apex of the V, it was fastened with catgut suture. The portion of the skin in the intestine was shaped like a V, and that outside had its apex immediately

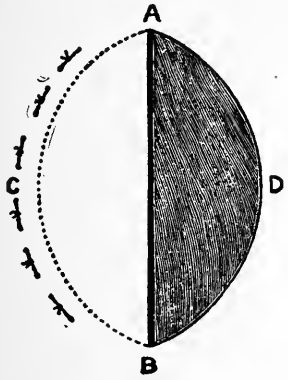

FIG. 164.

FIG. 165.—(McBurney.)

above the apex of the lower one. By this procedure fully an inch and a half of raw surface was brought in contact over the opening in the bowel, thus almost insuring sufficient adhesion, while the V-raw surfaces of the skin that was inverted into the bowel acted as a valve, and were held in apposition by the pres-

sure of the contents of the bowel. There was some oozing of fecal matter, for a few days after the operation, from the corners of the wound, but these slight openings closed readily by applying pressure with a sponge, and she is now in excellent health, perfectly recovered."

More recently Szymanowski's operation for the closure of urethro-perineal fistula has been applied to the closure of artificial anus—in one case very successfully by Parker Syms, of New York. The steps in the operation are as follows:

A single straight incision is made, from A, three-quarters of an inch in front of, to B, three-quarters of an inch behind, the fistula (Fig. 162). This incision passes through skin and superficial fascia, and closely skirts the right side of the fistula. The edge of this incision is raised, and, working with a small blade to the patient's right side, the skin and fascia are undermined until a pocket is formed including the area A C B F, the right edge of the pocket being indicated by the dotted line A C B.

On the opposite side, a curved incision, A D B, is then made, the greatest width of the flap thus marked out being three-quarters of an inch to one inch.

This flap must be generous and should include a good padding of fascia, as, when it is lifted, the shrinkage is great.

Before lifting the flap a thin layer of skin is removed from its surface. This is best done with small curved scissors, the superficial layer of skin being rapidly chipped off.

The freshening process is carefully extended over the entire area A D B F, excepting over a surface a little larger than the fistula, and immediately next to it.

The flap A D B is then dissected up close to the median line and inverted, its attached edge acting as a hinge and as a medium for blood supply.

Five or six fine catgut sutures are passed through the skin at different points a little beyond the dotted line A C B, into the pocket, then through the free edge of the flap, and then back into the pocket and out through the skin. Five or six loops are thus formed, by drawing upon which the flap is closely drawn down to the bottom of the pocket, and the free ends of the loops are tied. (See Fig. 165.) Two or three sutures of catgut are now passed with a curved needle through the upper surface of the inverted flap so as to firmly bind it to the parts beneath. Sometimes with interrupted and sometimes with a continuous catgut suture the free edge, A F B, is now securely fastened to the edge A D B.

It will be seen that none of these methods involve the opening of the peritoneum. Dupuytren's statistics covered forty-one cases, twenty-one of which were done by himself and twenty by others. Three cases were fatal. Of the remaining thirty-eight the operation was unsuccessful in eight, and successful in twenty-nine in periods varying from two to six months.

In more recent times the statistics of Heiman,[1] Körte,[2] Hoenel,[3] and Palloson give for the enterotome the following results:

In ninety-five cases sixty complete cures, twenty-six cases of persistence of the fistula, and nine deaths, four of which could be directly attributed to the operation.

In sixteen cases treated by the enterotome and subsequent plastic operations, ten were completely cured, in three the fistula persisted, two were unsuccessful, and one died of erysipelas.

With the bolder surgery of to-day so great care is not used in avoiding the peritoneum, and in cases of fæcal fistula, or artificial anus without spur sufficient to prevent the passage of fæces, the operator would have little hesitation in freeing the edges, whether the peritoneum was opened or not, turning them into the lumen of the bowel back to back, and closing the orifice by Lembert's suture. The statistics of this operation are, according to Palloson, in twenty-nine cases, eighteen cures and eleven deaths—five from peritonitis, three from obstruction, one from collapse, and two from pneumonia. According to Hoenel, in forty-three cases there were twenty-five cures, two failures, and sixteen deaths. These figures all apply to old cases of artificial anus or fæcal fistula, and are better than those which result from operations on recent cases ; for, as pointed out by Hache,[4] in the operation for the immediate closure of a fæcal fistula resulting from a gangrenous hernia, for example, we must add to the dangers inherent to the operation itself the danger of collapse, of general peritonitis, of secondary perforation of the intestine above the adhesions, of stercoreal abscess, and inanition. Kocher[5] lost all of his seven cases either of inanition or diarrhœa ; Morse[6] lost three out of seven of peritonitis or col-

[1] Dtsch. Med. Woch., 1883, No. 7.
[2] Berl. Klin. Woch., 1883, No. 50.
[3] Arch. f. Klin. Chir., 1887, xxxvi., fasc. 2.
[4] Le Bull. Méd., May 27th, 1888.
[5] "Corresp. be. für Schweize Aertze," 1886, No. 5.
[6] Wien. Med. Woch., 1882, No. 15.

lapse; and Körte[1] in thirty cases lost sixteen immediately and six after a few days.

These figures are deceptive, many of the cases being operations on strangulated hernia with fresh fæcal fistula while the patient was suffering from the attendant shock. In all such cases the rule now would be to form an artificial anus by bringing the two ends of the gut to the surface after resecting what was necessary; or, better still, to resect and establish an intestinal anastomosis at one operation. Reichel's statistics (quoted by Weir) show thirty-seven resections for artificial anus, with only two deaths.

In fistulæ of the pyo-fæcal variety the surgeon has to deal not only with a fæcal fistula, but an abscess sometimes of enormous extent. These may arise from an abscess around the intestine which has opened into it as well as upon the surface, or they may originate in an ulceration and perforation of the gut. They generally have their starting point around the caput coli in a typhlitis or perityphlitis, and if left without operative interference are more apt to point in the loin than anteriorly.

In dealing with this complicated and very grave condition the first effort should be directed to the abscess cavity, and this should be thoroughly opened up and drained, and by every possible means made to heal. The fistula is thus changed from a pyo-fæcal to a simple fæcal one, and the opening in the gut may then be attacked with some hope of cure. If it be small it may close by simple cauterization of its edges, or it may be sutured by Lembert's suture. If larger, and there is sometimes considerable destruction of the intestine, the surgeon may have to choose between enterectomy with anastomosis or anastomosis alone. Should the perforation be in the caput coli, enterectomy will be out of the question, and a union of the healthy gut above and below the diseased part may be the only resource.

[1] Loc. cit

CHAPTER XV.

CONSTIPATION AND FÆCAL IMPACTION.

It may be stated as a general rule that a person in health should have one daily evacuation from the bowels. And yet to this rule there are many exceptions; for some people in perfect health go to the closet both night and morning, and others but once in forty-eight hours, three days, or even longer. Usually at a certain hour in the twenty-four, which in a healthy person is fixed and invariable, there is felt a desire to relieve the bowels, caused by a physiological process carried on without the knowledge or will of the individual. Simply from the force of a habit which has existed for years, or from the effects of a routine mode of life—such as a morning meal taken at the same hour every day, and composed of the same articles of food—the muscular layers of the bowel begin a gentle rhythmic contraction which forces the solid fæcal residue contained in the sigmoid flexure down into the rectum, where its mere presence excites a desire for its removal. Thus far the process of defecation is purely involuntary; but beyond this it is under the control of the individual, and he may yield to this call of nature or disregard it and pay the penalty. A sensible person, having regard to his health and comfort, will promptly regard the hint that nature is ready to do her part in unloading the economy of its refuse, and will allow no light matter to interfere with the regular, daily morning evacuation of the bowels.

Should, however, the individual resist this hint of nature, and by a voluntary exercise of the will prevent the escape of fæces, the desire soon passes off; the mass is returned by reverse peristalsis to the sigmoid flexure, there to remain till nature repeats the call, or till a succession of bad symptoms forces the patient to seek relief in medicine.

It is a curious question how long a person may go without any evacuation of the bowels and without seeming to suffer any very severe consequences; and remarkable cases are on record, usually in women in the lower walks of life. Some of the fol-

lowing cases, taken from Johnston,[1] are almost incredible, but those in which the time is reckoned by months may easily be believed. Thus: In the *Amer. Jour. Med. Sci.*, 1846, p. 260, there is a case reported lasting three months and twenty-two days; in the "Dict. des Sci. Méd.," t. vi., p. 257, one by Renandin of four months; in the *Amer. Jour. Med. Sci.*, October, 1874, p. 440, one by Strong of eight months and sixteen days; in the *Bull. des Sci. Méd.*, t. x., p. 74, one by Valentin of nine months; in the London *Med. Gaz.*, vol. xi., p. 245, Staniland reports one of seven months; in the "Dublin Hosp. Reports," vol. iv., p. 303, there is one of eight months; Inman, in the *Half-Yearly Abs. Med. Sci.*, vol. xxxi., p. 275, reports one of two years; Devilliers, *Jour. de Méd.*, 1756, t. iv., p. 257, reports another of two years; Chalmers, *Med. Gaz.*, 1843, vol. xxi., p. 20, reports one of three years; and, finally, in the reports of the Phila. Med. Museum, 1805, vol. i., p. 304, there is one reported in which the patient went fourteen years without an evacuation of the bowels.

The causes of constipation are manifold. The first and simplest is one already hinted at—ignorance and carelessness on the part of the individual. Women suffer more than men because a false sense of modesty leads them oftener to neglect the call of nature, and because their habits of indoor life and lack of exercise lessen the force of the peristaltic movements of the bowel. Again, the condition of pregnancy leads often to a state of constipation while it lasts; and frequent repetitions of it are apt to render this chronic from a loss of muscular tone in the parts concerned in defecation.

The habits of life and the occupation of the individual are often the cause of his trouble. Brain work at the expense of physical exercise; over-eating and physical inertia; the necessity for sitting long in one posture (tailors, shoemakers, etc.); improper nutrition or lack of nutrition—anything which lessens the physical powers—may fairly be put down as a cause of this condition.

For the same reason old people and infants are more apt to suffer than the young and middle-aged, because of the general lowering of vitality and the absence of muscular strength.

Perhaps as common a cause as any is the habit of using laxatives in the form of pills or mineral waters; and this acts as does the habit of constantly whipping a horse—he soon expects to be whipped before he goes. This habit is the direct result of the universal dissemination of the now exploded idea of bilious-

[1] Pepper's "System of Medicine," vol. ii., p. 646.

ness—a hypothetical condition which every patient takes pride in discovering and treating with cathartics in his own person and his friends.

Many other causes might be dwelt upon at length—the use of drugs, especially opium and perhaps also tea; the loss of fluids from the body by certain exhaustive diseases; the lack of sufficient fluid with the food; and the use of food of too concentrated a quality and containing too little refuse matter.

Constipation is often also a symptom of gastric or intestinal indigestion, both in children and adults; and in the former it is sometimes due to the anatomical formation of the sigmoid flexure, which in them is relatively much longer and more convoluted than in adults (Jacobi). It is also an accompaniment of spinal disease, leading to paralysis. Recently a case of this kind consulted me, not so much for the constipation as for the painful secondary effects of the condition from which he was suffering. About a year before he had received a severe injury to the spine, ending in complete paralysis below the waist, and for several months his bowels never moved, and were only kept open by manual clearing out of the rectum. Latterly they have begun to show some signs of returning power, so that by large enemata and various mechanical means he succeeds in getting relief. But the result of these efforts and of the prolonged constipation has been to so loosen the attachments of the rectum that the mucous membrane is completely everted. In other words, he is suffering both from constipation and prolapsus.

A cause of constipation of more especial interest to the surgeon is the existence of any affection of the rectum or anus which renders the act of defecation painful—so painful that an infant will cry when placed on the pan, and will exert all its powers (and very successfully) to prevent a passage, and an adult will postpone the act as long as possible.

A prominent physician, who was under my care some years ago for fibroid tumors of the rectum, assured me that the act of defecation caused him such acute suffering that he always avoided it as long as he possibly could without being positively sick; and then, when he could postpone it no longer, was in the habit of administering chloroform to himself on the closet to deaden the pain.

The most common of these affections which tend directly to cause constipation on account of the suffering they give rise to in defecation are piles, fissures, ulcers, and fistula; but one

other cause which must never be forgotten in an obstinate case is the possibility that the bowel may be congenitally malformed in such a way as to render easy and complete evacuation impossible. There may be a congenital narrowing of the intestine two or three inches above the anus, which, as life advances, shall make itself more and more apparent in the way of difficult evacuation.

There is also a spasmodic contraction of the sphincter muscle which may be due to a congenital narrowness or may be acquired in adult life, and which will render defecation so painful that obstinate constipation is but the natural consequence. This is sometimes the result of fissure, and at others a purely nervous affection without fissure.

A painful affection of this kind may very soon establish a vicious circle which it may be difficult to break. First the pain causes a voluntary constipation; then the passage of hard, large masses of fæces does mechanical injury to the diseased parts and renders them worse; and in this circle the patient travels till complete loss of health and serious disease is the result.

Constipation is not only a symptom of disease, as in the cases enumerated, but is also a disease *per se*, attended by its own train of consequences. When long-continued it leads to certain changes in the bowel and adjacent parts. It is thus the most frequent cause of piles, fissures, ulceration, and abscess. Prolapse of the bowel is often caused by this condition, and cases of actual rupture from straining, with fatal consequences, have been reported.

In addition to these results, which, being external, necessarily attract the notice of the sufferer, other changes are often produced internally of which he or she may be entirely unconscious. The natural result of turning the large bowel into a reservoir for solid fæces is to cause dilatation of its calibre and paralysis of its walls. In this way it may assume vast dimensions, filling the entire abdominal cavity and pressing all movable organs out of their natural position.

The amount of fæcal matter which may accumulate in the large intestine, in cases of chronic constipation, is simply enormous. The whole abdomen may be practically filled with it. In one case fifteen quarts of semi-solid fæces were removed on autopsy; and in another the weight of the collection found in the bowel was twenty-six pounds.[1]

[1] Chelius, Heidelberg Med. Ann., 1838, vol. iv., p. 55. (Johnston.)

The obstruction caused by a mass of impacted fæces may end fatally, as in the following case from Bristow.[1] It was "that of a little girl, eight years old, whom I saw casually only during life, and of whose history I obtained, after her death, some not very perfect details. She had long suffered from tendency to constipation; and it was stated that she had occasionally gone as long as three weeks without passing an evacuation. At the time of her admission into the hospital there had been no relief to the bowels for seven weeks. She was then pale and thin, had a large, tense belly, without pain or tenderness, a clean tongue, and a poor appetite. She had a 'strumous' look and was supposed, I believe, to be suffering from abdominal tubercle. She became gradually more and more emaciated and anxious-looking, while the belly grew larger and more tense. She never had any distinct abdominal tenderness, but suffered at times from colicky pains, and often (especially toward the close of life) complained that she was so full that she felt as if she would burst. During the last week or two the tongue became somewhat foul, and she had frequent vomiting, but never of stercoraceous matter. She passed but little urine, and that was high-colored; she sank gradually from exhaustion, and died exactly three weeks after admission. Amongst other kinds of treatment adopted was the use of purgative medicines and of purgative injections; and the medical man in attendance on her was led to believe that they had acted. There is no doubt, however, from subsequent inquiries, as well as from what was observed after death, that he was deceived. At the post-mortem examination the form of the distended intestines was distinctly impressed on the tense and thin abdominal walls, and on opening the abdomen the enormously enlarged colon was at first alone visible. The distention began at the cæcum and extended to within two inches of the anus, where it ceased abruptly. In the greater part of its extent the bowel measured from nine to ten and a half inches in circumference, the greatest amount of distention being manifested in the sigmoid flexure. The muscular walls were hypertrophied from the ascending colon to the lower end of the sigmoid flexure; and in the latter situation (where the hypertrophy was greatest) they measured one-eighth inch in thickness. The mucous membrane seemed healthy in the greater part of its extent, but it presented some congestion here and there, and at distant intervals large patches in which there were groups of small, circular, shallow ulcers. The bowel contained no flatus,

[1] "Diseases of the Intestine and Peritoneum."

but was completely full of thick, semi-solid, olive-green colored fæces. These were more solid in the rectum than elsewhere, and immediately above the anus formed an indurated, conical lump. The small intestines were also considerably distended."

The treatment of chronic constipation is by no means a simple matter. It may be begun with a purgative such as three compound cathartic pills, for the sake of opening the way for future treatment; but here the administration of purgatives should end, for their repeated administration is calculated to do harm rather than good, by substituting an occasional over-action for the daily one which indicates a healthy state of the intestinal tract. The following suggestions may be found of use in the treatment of this condition, which is one that must be overcome at the commencement of the treatment of any rectal affections with which it may be associated.

Constipation may be due to deficient action of either the small or the large intestine, and this deficient action in either case may be the result either of deficient secretion or deficient nerve power.

Deficient secretion is very apt to be associated with hepatic disturbance, and is marked by dull headache, bad taste in the mouth, viscid secretion from the buccal glands, etc. This is a condition pretty sure to be aggravated by cathartics, for the reason that the temporary increase in secretion which they cause is followed by a corresponding decrease, which serves only to make the patient worse than before. For the purpose of increasing the natural secretion of the small intestine, the fruits containing citric acid, such as oranges, and other fruits, such as figs and apples, when the patient can digest them, all serve a good purpose. Water is also an excellent remedy, and two tumblerfuls of it taken in the morning will often be very beneficial. To it may be added a slight saline, which decreases its capability for absorption (℥ ss.–O. i.), and therefore increases the peristalsis; and the addition of a single grain of quinine is said to greatly increase the effect.[1] This treatment, if patiently persisted in for a few weeks, will generally be followed by a good result.

Deficient innervation will be found in most cases of constipation in old people, people of sedentary habits, and those who have little exercise. It is generally attended by deficient action of the skin and a sallow complexion. In such cases water will be found only to weaken the digestive power, unless it can be

[1] Thompson, New York Medical Record, May 5th, 1877.

combined with a different mode of life and abundance of outdoor exercise. Cold bathing, however, cold against the spine and abdomen, plenty of exercise in the open air, and nux vomica, will generally be found to give relief.

In constipation dependent upon the large intestine, the trouble will generally be found to be due to deficient innervation rather than to any lack in the secretion. It is best treated by keeping the rectum empty, by nux vomica, or belladonna in doses sufficient to cause dryness of the throat, and by electricity. The latter should be in the form of the faradic current, one pole being placed over the spine and the other passed up and down along the track of the colon.

Infantile constipation may be due, as pointed out by Jacobi, to the disproportionate length of the sigmoid flexure. In children it is not unusual to find two, or even three, flexures in the lower part of the colon, in which the fæces may remain until they become hard and friable, and when such an anatomical formation is associated with a deficiency of the intestinal secretion a very obstinate constipation, and even impaction, may result.

Dr. Eustace Smith[1] has thoroughly summarized the other causes of habitual constipation in children as :

First. Improper feeding. An excess of starch or of any article which overtaxes the digestive power may burden the alimentary canal with a large, undigested residue, and thus set up a costive habit.

By such means a mild catarrh of the intestinal mucous membrane is excited and maintained. There is an excess of mucus, and the fæcal masses, rendered slimy by the secretion, afford no sufficient resistance to the muscular contractions of the bowel, so that this slips ineffectually over their surface.

Second. Dryness of the stools. Even in the youngest infants the evacuations may sometimes be seen to consist of small, hard, round balls, like sheep's dung. This form of costiveness is generally due to insufficiency of fluid taken. The food is made too thick, or the needs of the system in the matter of water are overlooked. But whether the constipation be due originally to excess of mucus or deficiency of fluid, it cannot continue long without affecting injuriously the peristaltic movement of the bowels. As the colon grows accustomed to be overloaded, the intestinal contents can no longer exert a sufficiently stimulating influence upon the lining membrane, and

[1] Br. Med. Jour., July 7th, 1888.

the muscular contractions begin to flag. If the infant be badly nourished, this languor of muscular contraction may be aggravated by actual weakness of the muscular walls ; and as, under these conditions, the bowel is apt to be over-distended by accumulation of its fæcal contents, the expulsive force at the disposal of the patient is seriously impaired. Constipation due to the above-mentioned causes is often made more serious by the infant's own efforts to delay relief. A baby whose motions are habitually costive knows well the suffering which undue distention of the sphincter will entail, and often yields to the desire to go to stool only when it is no longer possible to resist. The pain is sometimes aggravated by the formation of little fissures, and the violent action of the sphincter, set up by their presence, forms an additional impediment to free evacuation.

The form of constipation due to mild intestinal catarrh is common enough in young infants. This is owing, no doubt, in great measure to over-abundant feeding with starchy matters, or to the giving of cow's milk without taking due precautions to insure a fine division of the curd. When constipation is due to this cause, our first care must be to protect the child's sensitive body so as to put a stop to the series of catarrhs. To do this it will not be sufficient to swathe the belly in flannel. The legs and thighs must also be covered, for so long as a square inch of surface is left bare the protection of the child is incomplete. The infant's diet must next be regulated with due regard to its powers of digestion. Excess of starch must be corrected, and it is best to have recourse to one of the malted foods. A certain variety in the diet is of importance in all cases where the digestive power is temporarily impaired.

In addition to the regulation of diet and clothing, the bowels should be regularly stimulated by manipulation. The sluggishness of peristaltic action may be very materially quickened by judiciously applied frictions. The nurse should be directed to rub the child's belly every morning after the bath. She should use the palm of the hand and ball of the thumb, and, pressing gently down upon the right side of the abdomen, carry the hand slowly round in a circular direction, following the course of the colon. The frictions may be continued for five minutes. In obstinate cases the child may be placed upon the bed, and the bowels gently kneaded with the thumbs placed side by side, the movements following the course of the colon.

In addition to the above-mentioned general treatment, more special measures may be necessary. These may be divided into

suppositories and enemata, and medicines given by the mouth. The time-honored piece of castile soap for a suppository is recommended, and the now popular enema of thirty or forty drops of pure glycerine. Large enemata of soap and water should be used only rarely, as great dilatation of the rectum and permanent loss of muscular tone are very apt to follow their continued use.

For the permanent cure of habitual constipation, remedies given by the mouth are greatly to be preferred, but strong purgatives are worse than useless. The aim should be to find the smallest dose which will awaken a normal degree of peristalsis, and to give this dose regularly so as to excite a habit of daily evacuation. The daily dose is most efficient when combined with a remedy which tends to give tone to the muscular coat of the bowel. For this purpose a useful draught is composed of half a drop of tincture of nux vomica, combined with ten drops of tincture of belladonna and twenty of infusion of senna, made up to a fluidrachm with infusion of calumba. This should be given at first three times a day before food, and subsequently reduced to twice and then to once daily. The liquid extract of cascara is useful in many cases, especially when combined with tincture of belladonna. Twenty, thirty, or more drops of cascara extract, with ten of tincture of belladonna, may be given with a few drops of glycerine every night.

When the motions are drier than normal, a saline may be given in addition to the liquid already recommended to be added to the diet. The saline may be combined with small doses of nux vomica and quinine. For a baby of five or six months, five to ten grains of sulphate of sodium may be given, with a quarter of a grain of quinine, half a drop of tincture of nux vomica, and a minim of aromatic sulphuric acid, in a teaspoonful of water, three times a day before food. If the remedy has been well chosen, its quantity may soon be diminished, and finally it may be discontinued.

An adult patient should first of all be instructed to have a regular time for the daily evacuation, and the best time for this purpose is immediately after breakfast. The time being fixed, the patient is to go to the closet whether the desire for a passage be present or not, and pass a certain time upon the commode. I generally recommend the time immediately after the morning meal for this purpose, because the breakfast itself often acts as a stimulant to this function, especially in those in the habit of taking a morning cup of coffee. If the patient be a man in the

habit of smoking, the first few whiffs of smoke often act in the same way; and there are many men to whom the morning cigar or cigarette is an essential to the daily evacuation. In such a case it must be a very decided opponent of the weed who would object to its continuance in moderation.

If the plain cold water taken in the morning has no effect, the mineral waters may be tried in its place with great advantage; and the patient may select the one most agreeable to the taste and which most effectually accomplishes the desired end. The morning meal may consist of whatever the patient most desires, but a dish of oatmeal or coarse cracked wheat and milk should always be an essential part of it.

A laxative bread may be made of equal parts of coarse Scotch oatmeal, whole wheaten flour, and coarse ordinary flour, with yeast or baking powder. This may be eaten once or twice daily.[1]

I have almost always found that where perfect regularity in the daily life with regard to eating and exercise can be established, the function of defecation will also be performed regularly, provided the diet be plain and rather coarse in quality. To have a copious, well-formed evacuation, it is necessary, first of all, that the diet should be composed of substances which leave a considerable quantity of waste, and chief among these are the coarser grains and the vegetables. In women a certain regulated amount of daily out-door exercise should be insisted upon, in spite of all excuses and professions of disability. If necessary, this may be small at first, and gradually increased; and in a woman who has lost the habit and perhaps almost the power of walking, considerable tact and firmness on the part of the physician may be required to carry out this part of the treatment, but it will be found to be care well spent.

In addition to these dietetic and hygienic rules, certain medication may and often will be found necessary. This should be of the mildest possible kind which will accomplish the object. A pill which I have found to act very effectually and pleasantly under these circumstances is made after the following formula:

℞. Pulv. aloes soc..... gr. iss.
Ext. nucis vom..... gr. ss.
Ext. belladonnæ..... gr. ⅛
M.

[1] W. H. Taylor, Lancet, May 31st, 1879.

One of these should be taken at bedtime, and will generally be followed by an easy passage on the following morning. If this does not work satisfactorily, various other remedies may be substituted, amongst the best of which is the compound licorice powder, the rhubarb and soda mixture, or the dinner pill; the object being to find one among the many laxative preparations which, without causing pain or diarrhœa, will give an easy and natural evacuation of the bowels once every day.

The use of enemata for chronic constipation should not be commenced till all other means have failed, for the reason that when once the bowel has become accustomed to this form of stimulus it will be found very difficult to discontinue its use. In some cases, however, their employment may be a necessity, and they are always much less harmful than purgatives. Instead of the ordinary enema of soap and water, the introduction of a harmless foreign body into the rectum will sometimes excite peristalsis. Small fragments of soap or of candles are preferred by many for this purpose to fluid injections.

In cases where enemata have lost their power from prolonged use, my own practice is to resort to the use of a long rectal tube two or three times a week; but this should not be trusted to the patient for fear of accidents. Most patients will find it impossible to introduce them easily, and will not care to make the attempt. With a long flexible tube of small calibre a pint or more of water may easily be thrown into the sigmoid flexure and colon, and the bowel be thoroughly emptied.

Impaction of Fœces.—The impaction of fæces may be due to several causes, but is most generally a symptom either of intestinal atony in old people or of some paralytic affection such as locomotor ataxia. It not infrequently occurs in women as a result of the entire neglect of the function of defecation, for which they are perhaps unjustly celebrated; and it may follow a partial paralysis of the rectum from the long-continued use of large enemata, or the pressure of the fœtal head in childbirth. It may also result as a consequence of a painful affection, such as a fissure, which renders each act of defecation an agony to be avoided by every possible means. The disease is generally one of old people, of hysterical girls, and of careless women; but it has been seen in children, and as a result of improper diet may occasionally be encountered in young and healthy men.

Intestinal concretions may be composed entirely of hardened and stratified or clayey masses of fæces, or they may contain within them as a nucleus a biliary calculus, or indigestible sub-

stances which have been hastily swallowed, such as peach pits, cherry stones, etc. Mollière calls attention to the presence of magnesia, which favors the aggregation of fæcal matters, and which also may act as the nucleus of a scybalus ; and the frequency of impaction during the famine in Ireland in 1846, when potatoes, and those of a very poor quality, were the only article of diet, is a well-known historical fact.[1] In Scotland, where oatmeal is a favorite article of diet, fæcal accumulations are said to be of frequent occurrence. Certain other drugs besides magnesia, such as chalk, sulphur, and powdered cubebs, have been blamed as the cause of intestinal concretions. Intestinal calculi have been seen which were composed of pure cholesterin, or of a biliary calculus coated with cholesterin.

The usual location of a mass of impacted fæces is the rectal pouch, but it may be situated anywhere between the cæcum and this point. The symptoms to which it gives rise are generally sufficiently well marked to enable the practitioner to reach a correct diagnosis if he be on his guard. The pains which it causes will generally be obscure and may be located anywhere in the abdomen or in the lower extremities ; and the signs of disturbance in digestion are not in themselves sufficiently marked for diagnosis, but the one symptom which is characteristic is diarrhœa.

Just as the practitioner has to learn that incontinence of urine may be a sign of a distended and not an empty bladder, so he may have to learn by a disagreeable error in diagnosis that a diarrhœa is sometimes a result of an overfilled and obstructed rectum. This diarrhœa is peculiarly fœtid in character, and the matters discharged may be entirely free from fæces and consist entirely of mucus. In some cases there may be an approach to a daily natural evacuation. The act of defecation is always attended by straining and pain as the fæcal ball is pressed down against the perineum and rises again when the muscular effort ceases. To these symptoms Allingham adds a peculiar ringing, barking cough, morning vomiting (particularly in women), and night sweats. Besides these we see coldness and swelling of the feet from pressure on the pelvic and abdominal veins ; varicose veins in the legs ; varicocele ; shooting pains in the legs, groins, and loins from pressure on the sacral nerves ; seminal emissions, jaundice, and albuminuria from pressure.

Of course errors in diagnosis are easy in such a condition as

[1] For description of these cases see article by Dr. Papham in the Lancet, 1850.

this, and a mass of fæces in the colon may be mistaken for any and every sort of tumor in the pelvis or abdomen. Liver, spleen, stomach, uterus, and ovaries have again and again been supposed diseased in these cases, when a simple digital examination of the rectum, or in women even of the vagina, could not fail to make the diagnosis clear. Unfortunately for diagnosis, the general practitioner is not fond of making rectal examinations, and these cases are not infrequently treated with bismuth and opium as a consequence.

The treatment of impaction is simple, and consists first of all in the entire removal of the mass. In cases of paralysis, where the accumulation has not been allowed to reach any very great amount, and the scybala are small and not very hard, this may sometimes be accomplished by the use of injections with a long tube and the assistance of the finger of the operator.

In women very effectual aid may be rendered under similar conditions by pressure from the vagina, by which small masses may be extruded one after another, each with a certain amount of pain, but without laceration of the mucous membrane at the anus. This plan of treatment will often constitute one of the regular duties of the attendant upon a case of paralysis—a disagreeable duty which must be attended to at certain regular intervals.

In cases of longer standing, however, these means may be entirely inadequate, and all injections, no matter what their supposed solvent virtues, will be of no avail even if they are not at once ejected. In such cases the operation of breaking up and removing the mass must be begun by the administration of ether and dilatation of the sphincter. This accomplished, the mass may be attacked with the fingers, an iron spoon, a pair of lithotomy forceps, or scoop, and removed piece by piece. When this has been done, an injection may be administered through the long tube and more matter will generally come down from the sigmoid flexure. The impacted mass is often as large as the fist, and sometimes as a fœtal head, and the amount in the sigmoid flexure and colon may be much greater, though not as hard, so that at a single sitting an enormous amount may be removed.

After such an operation as this, the patient must be treated by injections and a daily laxative, as described in speaking of constipation, till the over-distended rectum has recovered its tone. This may require a considerable time.

CHAPTER XVI.

PRURITUS ANI.

Pruritus ani—itching at the anus—is generally a symptom of some other disease, such as hæmorrhoids or eczema, but it is often present in a marked degree when no cause for its existence can be discovered. It is an exceedingly painful and annoying affection, and one which will often tax the powers of the surgeon to the utmost for its cure. It is met with in both men and women, and seems to be dependent upon no particular general state, being found in rich and poor, the overfed and underfed, the professional man of nervous constitution and the laborer, alike.

The disease is marked by an itching at the anus which is more or less constant, but is generally worse after the sufferer has become warm in bed at night. The itching causes an attempt at relief by scratching, and the scratching, though it may be controlled during the day, is generally practised unconsciously during sleep to an extent which causes laceration of the skin. The itching in bad cases, even when constant, is marked by exacerbations and remissions, and may cause an amount of suffering which is simply unbearable.

The disease is attended by certain changes in the appearance of the parts. The skin becomes thickened and parchment-like (Fig. 166) or else eczematous and moist from exudation. It may be red from the scratching, or there may be quite a characteristic loss of the natural pigment of the anus. In the latter case the skin becomes of a dull-whitish color, and this will oftener be noticed where the disease is of long standing and severe. The exudation may be very marked where the itching is slight, and may be attributed by the patient to trouble within the rectum instead of to its real source. Associated with the changes in the skin it is not at all uncommon to find one or several fissures.

Causes.—The cause of pruritus may sometimes be easily discoverable, and in such cases a cure rapidly follows its removal. For example, pruritus is often a symptom of internal

hæmorrhoids, and is easily and effectually cured by their removal. Again, it is often a symptom or complication of a fistula with a small external opening, such as may easily be overlooked in a cursory examination, and is cured by the ordinary operation and the consequent cessation of the discharge upon which it depends. It is often dependent upon the presence of the *oxyuris vermicularis* in the rectum, and in every case these should be carefully looked for. If they are present they may generally be seen like small pieces of white thread between the radiating folds at the margin of the anus, especially at night when the itching begins. They may generally be eradicated by certain simple measures, the best known of which is an enema of lime water, or of carbolic acid, ʒ i.; glycerine, ℥ i.; and water,

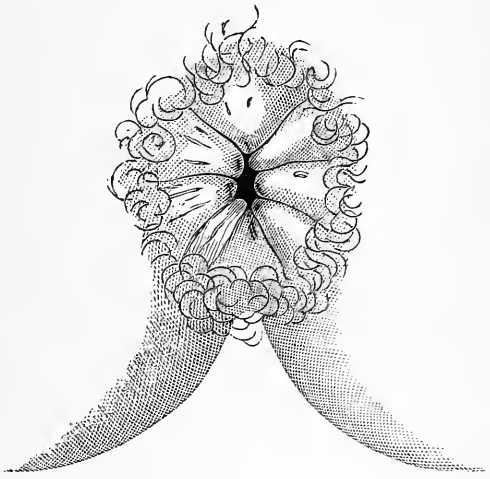

Fig. 166.—Thickened Condition of the Skin in Pruritus. (Esmarch.)

℥ vij., injected after each passage. Turpentine and tincture of iron may be used for the same purpose, and are both very effectual; but the parasites are much more easily removed in children than in adults, and I have had one case which was exceedingly intractable, and in which I have never been able to keep the worms from returning for any great length of time. A single examination should never be considered as proof of the absence of this parasite in an obstinate case of pruritus.

Instead of a parasite located within the rectum, pruritus is occasionally easily accounted for by the presence of pediculi. In such a case the diagnosis and cure are alike easy.

Again, the parasite may be vegetable instead of animal, and the itching may be due to the disease known as *eczema margi-*

natum. In this case the diagnosis will rest upon the finding of the spores, under the microscope, in the epidermis scraped from the edge of the affected spot and moistened with glycerine. The most effectual remedy for this condition is a wash of equal parts of sulphurous acid and water frequently applied with a soft cloth, and gradually increased in strength, if necessary up to the pure acid, which latter is, however, generally a painful application, and one which will readily blister. The acid, even when diluted to a considerable extent, will blister if covered with a cloth. Strong tincture of iodine applied with a brush is also an effectual remedy in eradicating the plant.

Pruritus may also be dependent upon other skin diseases, among which chronic eczema is perhaps the most common, and this is to be treated exactly here as elsewhere in the body, first by general measures directed to the constitutional state, and second by local applications. The congestion and the thickening of the skin must first be remedied, and for this purpose very hot water, compound tincture of green soap, and if necessary a solution of caustic potash, may be applied. The water, to be of any use, must be as hot as the fingers can bear, and should be applied to the part with a soft cloth and held there till it begins to cool. This may be repeated half a dozen times, but all rubbing should be carefully avoided both during the application and in drying the parts after it. This is a favorite remedy with most dermatologists; it should be used just before going to bed, and is often in itself sufficient to insure a good night's sleep.

If there be thickening of the skin from effusion, a stronger application than hot water will be necessary; and for this the compound tincture of green soap is a good remedy, or the solution of potash (gr. v.–℥ i.) or liquor potassæ may be resorted to with caution. The formula for the compound tincture of green soap is the following:

℞. Saponis viridis,
Olei cadini,
Alcohol.....āā ℥ i.
M.

It is a much stronger preparation than the simple green soap, and also a much more disagreeable one, but it is very effectual and should be well rubbed into the part once a day. These remedies should be followed at once by soothing ointments or lotions. A good ointment is the ordinary oxide of zinc made soft and applied gently, and one which is pretty certain to allay

itching is that made of chloroform (℥ i.–℈ i.). This soon loses its power by the evaporation of the chloroform, and should on this account be kept in a wide-mouthed glass bottle, tightly corked, and should be frequently renewed. Another favorite application, and one which is very generally effectual, consists in a lotion of carbolic acid. The formula is:

℞. Acid. carbolici..... ℈ ss.
Glycerinæ..... .... ℈ i.
Aquæ..... .... ℈ iij.
M.

This may be applied at night, and if found to be too strong may be diluted by the patient. In a more dilute form it may also be continued for a considerable time after all symptoms have ceased.

For the sake of those who have never encountered an obstinate case of this disease, but who are pretty sure at some time to have both knowledge and ingenuity taxed to the utmost, I will give one or two more formulæ which have been found reliable. The following comes from Allingham, and by it alone he has "seen a bad case cured in forty-eight hours":

℞. Liquoris carbonis detergentis (Wright's),
Glycerinæ .....āā ℈ i.
Pulv. zinci oxidi,
Calamin. præp.....āā ℈ ss.
Pulv. sulph. præcip.... ... . ℥ ss.
Aquæ puræ..... ... .ad ℈ vi.
M.

The part affected is to be thickly painted over with this once or twice a day and allowed to dry. The white precipitate ointment, made soft with vaseline or glycerine, is also a good application, and the following lotion, also from Allingham, will often work well in allaying irritation:

℞. Sodæ biboratis..... ℥ ij.
Morph. hydrochlor ..... gr. xvi.
Acidi hydrocyanici dil..... ℈ ss.
Glycerinæ..... ℈ ij.
Aquæ.....ad ℈ viij.
M.

This should be applied to the part four or five times in the twenty-four hours. Dr. Bulkley[1] has also recommended the following as being useful, and I have often found it so:

[1] The Medical Record, December 18th, 1880.

℞. Ungt. picis ..... ʒ iij.
" bellad ..... ʒ ij.
Tr. aconit. rad ..... ʒ ss.
Zinci oxidi ..... ʒ i.
Ungt. aquæ ros ..... ʒ iij.
M.

The following prescription has also been very efficient in my hands. I am indebted for it to Dr. Salisbury:

℞. Menthol ..... ʒ i.
Simple cerate ..... ℥ ij.
Oil sweet almonds ..... ℥ i.
Carbolic acid ..... ʒ i.
Pulv. zinci ox ..... ʒ ij.
M. Apply morning, noon, and night, after cleansing the parts.

An ointment of chloral and camphor, a drachm of each to the ounce, is also at times effectual in allaying itching.

There are two other skin diseases, either of which may be the cause of pruritus—herpes and erythema. Herpes at the margin of the anus is the same as when seen on the lips. In the latter case it heals spontaneously, in the former a dressing may be necessary. This may consist simply of a dry powder such as zinc or bismuth, or of one of the lotions already mentioned. Erythema will be found chiefly in fat people, where it is due to contact of the opposing cutaneous surfaces. It also is best treated by the application of dry powders, and by separating the opposed surfaces by a layer of dry sheet lint or old muslin.

These are the most palpable, and perhaps also the most common, causes of pruritus, but there are many cases in which the cause is not so easily discoverable, because it is a constitutional and not a local one. Where no local cause can be detected, a careful inquiry must be instituted with regard to the patient's general health and habits. If chronic constipation be present, this must first of all be overcome, for this is in itself an efficient cause for the disease.

Another not infrequent cause of pruritus is derangement in the function of the liver. This may or may not be associated with constipation. It must be treated by general dietetic measures, the dilute mineral acids, occasionally by doses of podophyllin, active out-of-door exercise, and cold and friction applied to the hepatic region. In women uterine disorders must be looked for and cured before very much will be accomplished in

the treatment of pruritus; and in women also the urine must be examined for sugar in obstinate cases, for diabetes will sometimes give rise to incurable pruritus.

In case none of these causes can be found to account for the itching, errors of diet must be searched for, and corrected when found. Anything like excess in smoking or in alcoholic drinks will keep up the disease, and in men these habits must be carefully regulated if indulged in at all. The disease will sometimes be encountered in stout, full-blooded persons who live well and perhaps incline to the gout, and who show no other signs of disorder. In such, active exercise and plainer living, with cold bathing of the part at night and morning, and the use of a lotion of carbolic acid, will often effect a speedy cure. On the other hand, the disease may be present in exactly the opposite class of persons, the overworked and worried professional or business man, and it is in this class of cases alone, where the itching seems to be purely a nervous symptom, that arsenic is indicated. It may be combined with quinine and cod-liver oil, and carried up to its full physiological effect. As a relief for the intolerable itchings at night, Allingham recommends the introduction of "a bone plug shaped like the nipple of an infant's feeding bottle, and with a circular shield to prevent its slipping into the bowel." Its benefit is explained by the pressure it exerts upon the terminal filaments of the blood vessels and nerves of the anus.

In this way, then, the physician must undertake the cure of a case of pruritus ani; and not by the administration of any single lotion or ointment to allay the itching, which is but the symptom of some local or general condition. In every case the cause must be found and removed if success in the treatment is to be gained. I know of no disease of the rectum or anus in which there is a better chance for the practitioner to show his general knowledge and skill. If a case be undertaken in this way, and the treatment be intelligently followed by both doctor and patient, a cure may generally be effected; sometimes in a very few days, but at others only after prolonged effort and many discouragements. The prognosis should, therefore, be guarded at the outset, lest the patient be led to expect a too speedy relief; and in some cases, in spite of the best of care, the disease will frequently return, and the patient can scarcely at any time consider himself as perfectly cured.

CHAPTER XVII.

WOUNDS AND FOREIGN BODIES.

WOUNDS of the rectum may be either contused and lacerated, or incised. The latter most frequently result from surgical operations, and may be intentionally inflicted, as in the operations for fistula or for the removal of tumors; or the result of accident, as in the operation for stone. Contused and lacerated wounds are generally the result of accident, and perhaps the most frequent cause of such an injury is the perforation of the bowel with an enema tube, a bougie, or a urethral sound. The gravity of this accident will depend upon two factors—whether the perforation of the bowel is above the peritoneum, and whether the enema has been deposited in the perirectal tissues. The latter complication will be followed by abscess and peritonitis, and will result either in death or in stricture and fistula. If the wound be uncomplicated by the injection, the mere puncture may heal spontaneously. It is oblique from below upward, and this greatly favors spontaneous healing without fæcal extravasation.

Dr. Achilles Nordmann, of Basel, has published a description of twenty-five bowel lesions due to the administration of enemata. They include three complete perforations, and ulcers and wounds of various depths and sizes. The causes of these wounds seem to have been the use of defective instruments, ignorance of the anatomy of the rectum, catching the transverse folds on the end of the tube, extreme irritation of the mucous membrane of the bowel, and obstructions caused by such conditions as a fœtal head, an enlarged prostate, or a misplaced uterus.

As a rule, these lesions are to be found on the anterior wall from one to seven centimetres from the anus. They are not always easy to diagnosticate, as other foreign bodies or caustics may produce similar appearances. Tubercular or hæmorrhoidal ulcers may be mistaken for them. A perforating wound gene-

rally results in serious periproctitis, which may end fatally, or in stricture.

Esmarch has met with four cases of this injury, none of which were fatal, though attended by much local trouble. Velpeau describes eight cases, six of which ended fatally. Passavant observed five cases, one fatal. Chomel has had two fatal results. There are two preparations in St. Bartholomew's Hospital showing the results of this accident, one in a man, the other in a child ten years of age (Esmarch).

Besides these most common injuries, many others may be enumerated. The person may fall upon a sharp body, as the point of an umbrella (Bushe [1]), may be caught upon the horn of an animal (Gundrum,[2] Ashton), or may be impaled upon a spike (Esmarch [3]). Thompson [4] describes the case of a man, aged eighteen, who stated that he had fallen about four feet, in a sitting posture, on to the end of the upright shaft of a smith's hammer, which he described as having entered his seat for a considerable but unknown distance, and requiring some amount of force in its removal, which was accomplished by a fellow-workman. He had very little pain at the time of the accident, and walked about a mile to the infirmary without much trouble. On examination only some slight bruising was found around the anus, with a little blood-stained mucus. *Per rectum* nothing was detected. The abdominal walls were quite flaccid. Examinations caused no pain. He complained, however, of a slight, continuous, aching pain just above the pubes. Soon after admission he passed both urine and fæces, the former normal, the latter soft and streaked with blood. Some hours later he passed another motion, with a considerable quantity of clotted blood; the suprapubic pain also became more intense, but the abdominal walls still remained flaccid. The face was very pale, the pulse rather weak, and the extremities cold; but the patient appeared to be in good spirits, answered questions readily, and did not feel unwell. He remained in this condition until midnight, when the abdominal pain became more severe. Symptoms of collapse gradually came on, and he died at 8 A.M. At the necropsy, on the same morning, the peritoneum was everywhere found intensely injected, and in part presented a thin layer of lymph. There was a marked laceration in the recto-vesical pouch

[1] Op. cit., p. 80.
[2] Detroit Lancet, October, 1879.
[3] Op. cit., p. 43.
[4] Lancet, December 3d, 1887.

a little to the right of the middle line, which led into a triangular opening in the wall of the rectum about three inches from the anus; this aperture was triangular, its base measuring one inch and a half, its sides an inch each. At the brim of the pelvis, on the right side, was a laceration of the peritoneum covering the psoas, with bruising of the subjacent muscle. The mesenteric glands were enlarged and inflamed. The abdominal cavity contained a small quantity of hard fæces; there was also found a piece of cloth corduroy two inches long and one inch and a half in breadth, corresponding in texture to the patient's trousers and to an aperture in their seat.

In such cases the accident may be immediately fatal from collapse, and the wound in the rectum may be complicated by a wound of the peritoneum or of any of the adjacent organs. The body which has done the injury may also be so firmly implanted as to require great force and an anæsthetic for its removal.

The rectum is not infrequently lacerated in childbirth, and although such wounds are generally of slight extent, Bushe[1] relates a case in which the child's head was passed through the anus. It has also happened that in a violent effort to expel a mass of hard fæces the rectal wall has given way. Mayo[2] relates one such case in a woman of forty, in whom the rupture was in the recto-vaginal septum, about two inches within the bowel. Ashton[3] reports a similar case, and Bushe[4] another. Such a rupture may be either vertical or transverse, will be marked by sharp pain at the moment of the accident, and will be followed by a discharge of blood. It is doubtful whether it ever occurs without previous disease of the wall of the bowel.

The consideration of gunshot wounds comes more properly within the scope of military surgery. They are always complicated with injuries of other parts, and are generally fatal from extravasation of urine or fæces.

The complications which may attend a wound of the rectum have already been hinted at. They are hæmorrhage, either primary or secondary; fæcal infiltration; purulent infiltration; peritonitis; emphysema; hernia; invagination; and later, stricture and fistula. When fæces are forced out of the rectum into the adjacent tissue, diffuse inflammation and gangrene will

[1] Op. cit., p. 80.
[2] Op. cit., p. 13.
[3] Op. cit., p. 152.
[4] Op. cit., p. 69.

probably result, and the condition must at once be met by free incisions and free drainage, as has been described in the chapter on abscess. The danger of fæcal infiltration may be lessened by a diet which shall prevent fluid passages, and by the free use of opium. A dilatation or a free division of the sphincter is also to be recommended, so that a free outlet may be accorded to the contents of the bowel.

Emphysema, as a result of a perforation, is generally confined to the perineum, but may be diffuse.[1] It is very apt to be fatal from diffuse inflammation and septicæmia due to the putrid nature of the gas, and is to be met by free incisions.

Wounds of the bladder or urethra communicating with the rectum are to be met by providing for the free issue of the urine. This may be done by catheterism, by aspiration, or by free division of the sphincter.

Where none of these complications exist, a fresh wound of the rectum may close by first intention, and an effort should always be made to secure this by rest in bed, by emptying the bowel, and keeping it empty by frequent washings with water, and by the use of opium. Healing by granulation will, however, be the rule. In some cases, such, for example, as laceration in childbirth, sutures may be at once applied.

As Ball points out, the proper method of treatment for punctured wounds low down in the rectum is free incision through the sphincter up to the wound to allow of drainage.

Of gunshot wounds of the rectum during the Civil War, Otis[2] collected 103 cases, with a mortality of 42.7 per cent; in 34 of these the bladder also was wounded, with a mortality of 41.17 per cent.

Foreign Bodies which have been Swallowed.—Medical literature is full of curious cases in which foreign bodies have been swallowed, either accidentally or by design, and have in some cases passed the full length of the alimentary canal and been safely voided with the fæces, or in others have become entangled in the mucous membrane and given rise to much trouble. Every practitioner is familiar with cases of peach-stones and coins which have been accidentally swallowed, and knows how generally such substances take care of themselves and cause no symptoms after once passing the œsophagus. Much larger substances, such as whole or partial sets of false teeth, and the vari-

[1] Lancet, January, 1860, p. 89.

[2] Ashhurst, "Encyclopædia of Surgery," vol. ii., p. 199. Quoted by Ball.

ous things with which performers in travelling shows entertain an audience, may also be passed in safety.

To show what nature is capable of in this line, it may be well to enumerate the substances which were swallowed and safely voided by a certain lunatic now become famous. The patient stated that she had been swallowing nails, etc., and a dose of castor oil brought away two pieces of faïence one or two centimetres long and about the same breadth, two nails, and a pebble. During the following six weeks she passed nineteen large pointed nails, a screw seven centimetres long, numerous fragments of glass and china, a piece of a needle, two knitting needles, fragments of whalebone, etc., amounting in all to three hundred grammes. During all this time the patient ate and drank as usual, and seemed in ordinary health.[1]

Prof. Agnew "saw in the dissecting room of the Philadelphia School of Anatomy a female subject, afterward learned to have been insane, in whose intestinal canal from jejunum to rectum were found three spools of cotton partially unwound; two roller bandages, one of them two and a half inches wide and one inch thick, the other was partially unrolled, one end being in the ileum, the other in the rectum; a number of skeins of thread, a quantity being packed tightly in the cæcum; and finally a pair of suspenders."

Prof. Gross records the "case of a man who swallowed a bar of lead, ten inches long, upward of six lines in diameter and one pound in weight, whilst performing some tricks of legerdemain," which was removed by gastrotomy and the patient recovered in two weeks. He also mentioned another case in which a teaspoon was swallowed whilst the patient was in a paroxysm of delirium, which was removed from the ileum by enterotomy, recovery taking place in a few weeks.[2]

It would be beyond the scope of a work such as this to attempt to deal with the whole question of foreign bodies in the alimentary canal, and the accidents which may attend them. In a general way, the prognosis is good unless the foreign body be a very ragged one or a large, sharp one like a fork; and the treatment consists in giving a diet, like bread and fruit, which will cause copious stools, with little drink, and the avoidance of exercise such as walking. If complications arise, they must be treated on general surgical principles; and at the present day no patient would be allowed to die from the effects of a foreign

[1] Lancet, 1866, vol. i., p. 23.

[2] Randolph Winslow: Maryland Medical Journal, March, 1880.

substance in the stomach or intestines without a surgical operation for its removal, provided only the diagnosis were clear.

The complications which may attend the detention of such substances in the rectal pouch just above the internal sphincter are ulceration with perforation, hæmorrhage, and abscess. Ulceration may be caused by the pressure of a large body, and may cover a considerable space; or it may be caused by the pressure of the sharp ends of a smaller body, in which case the spots of ulceration will be smaller, and may be located at two opposite points in the rectum. As a result of ulceration, there will be more or less pain, purulent discharge, and perhaps also a sharp hæmorrhage from the erosion of a vessel. When perforation of the wall of the bowel has occurred, inflammatory action is almost sure to be excited in the surrounding parts, and this may vary greatly in its extent and gravity. If the injury be above the point of reflexion of the peritoneum, it may cause either a localized or a general peritonitis. A general peritonitis caused in this way will be fatal, as it is also generally accompanied by more or less extravasation of fæces. A circumscribed peritonitis with formation of an abscess is a less fatal complication. Under these circumstances the usual signs of pelvic abscess will be present—fever, pain on pressure, tympanites, painful defecation and urination—and by careful examination a tumor may be discovered, either through the rectum or at the bottom of the iliac fossa. Such cases, when the tumor is on the right side, are often mistaken for cases of perityphlitis, but the tumor is not in the same location; it is deeper and nearer the median line.

Such an inflammation may terminate in resolution, provided the cause be discovered and removed; but the usual termination is in suppuration, and the pus, if not removed by the surgeon, may find its way into the general peritoneal cavity or into the bladder or rectum. Abscesses of the superior pelvi-rectal space have already been described, and those which are due to foreign bodies in the bowel do not differ from them in general characters.

When the focus of inflammation is located below the reflexion of the peritoneum, the prognosis is less grave. Phlegmonous abscess may form in the ischio-rectal fossa, and must be treated according to the rules already laid down; but here the difficulty is well within the reach of the surgeon, and a cure may confidently be looked for by proper care.

Foreign Bodies Introduced per Anum.—A classification of these cases is useless. The foreign bodies may be introduced

through traumatism; by the patient in an honest endeavor to relieve himself of piles or prolapse; by the surgeon for the purpose of relieving rectal disease. They are often introduced in a spirit of revenge or of trickery; and most often of all they are lost in the practice of an unnatural vice. Edward II. is said to have met his death by having a red-hot iron thrust into the rectum. "We seized the king," said one of the murderers, "and threw him forcibly upon the couch, and, whilst I kept him there by the assistance of a table, with a pillow on his face, Gurney inserted through a horn-tube a red-hot iron into his bowels." (Gross, vol. ii., p. 627.)

The case of the prostitute into whose rectum the students of the University of Göttingen introduced a pig's tail, butt end first, is as follows:

"Some students had formed the plan of playing a practical joke on a prostitute; they determined to push into her anus a frozen pig's tail. They cut the hairs very short in order to make them sharper and rougher, then dipped it in oil and forcibly introduced it into the woman's anus, with the exception of a portion, three fingers' breadth in length, which remained outside. Several attempts were made to extract it, but, as it could only be withdrawn against the hairs, the bristles penetrated the mucous membrane and gave rise to excruciating pain. In order to relieve it various oily remedies were given by the mouth, and the attempt was made to dilate the anus with a speculum in order to extract the tail without violence, but it was unsuccessful. Severe symptoms developed—violent vomiting, obstinate constipation, very high fever, and intense pains in the abdomen. Marchettis was summoned on the sixth day. This physician, having been informed of what had happened, invented a very simple and ingenious device. He took a hollow reed, one end of which he prepared so that he could easily introduce it into the anus, and completely enclosed the pig's tail in this reed, in order to withdraw it without pain. For this purpose he attached to the tail, by the end which projected from the anus, a stout wax thread which he passed into the reed. With one hand he pushed this form of canula into the rectum, and held the cord with the other to prevent the tail being pushed in still further. He succeeded in completely enclosing the tail, and promptly relieved the patient."[1]

A punishment for adultery among the Greeks is said to have been the introduction into the rectum of a peeled radish cov-

[1] Hevin, p. 339.

ered with hot ashes; and cases in which patients have fallen upon sharp and fragile objects, such as the wooden pickets of a fence, which have broken off and remained in the rectum, are on record.

The list of foreign bodies which have been lost in the rectum by ignorant persons, in attempts to check a diarrhœa or to prevent the descent of piles or prolapse, is a very long one, and includes such substances as bottles, sticks of wood, and round stones, some of them of a size relatively enormous; and the use of the rectal pouch by criminals for the purposes of concealment is well known to the police.

In the Museum of Anatomy and Pathology at Copenhagen is a longish, oval, flat stone, about six and three-quarter inches long, two and a half inches wide, one and a half inches thick, and weighing nearly two pounds, which a patient in Bornholm introduced into his rectum to prevent prolapse, from which he had for a long time suffered. The stone was extracted by a surgeon, Frantz Dyhr, in 1756.[1]

A little case with a very ingenious housebreaking and other thieves' instruments was found by Dr. Closmadeuc at the necropsy of a man in the prison at Vannes. The man had died of acute peritonitis, from which he had suffered seven days. During his illness a hard, rather large body was felt in the left side of the hypogastrium; he said that it was a piece of wood containing money, which he had introduced into the rectum; this, on exploration in the meantime, was found empty. On section, the case, which was cylindro-conical in form, lay in the transverse colon, with its apex directed toward the cæcum; it was of iron, and was wrapped in a piece of lamb's mesentery; it weighed about twenty-three ounces, was about six and a third inches long and five and a half in circumference, and contained thirteen tools and some coins.[2]

"A monk, desiring relief from a severe colic from which he was suffering, was advised to introduce into the rectum a bottle of Hungary water, in the cork of which there was a small opening through which the water gradually distilled into the intestine (these bottles are usually long). He pushed it so far that it entered the rectum altogether, whereat he was greatly astonished. He could neither have an evacuation nor receive an enema; inflammation and death were apprehended. A mid-

[1] Bull. de la Soc. de Chir., 1878, p. 660.

[2] London Medical Record, December 15th, 1878. Abstract of Studsgaard's paper read before Soc. de Chir., Paris, October 9th, 1878.

wife was consulted in order to see whether she could introduce her finger and extract the bottle, but she was unable to do it. Forceps, a ripping iron, and anal speculæ were useless. It could not be broken; this would have been more disastrous, as the pieces of glass would have wounded him. Finally a little boy, eight or nine years old, was found, who introduced his hand and had sufficient address to cure the good monk." [1]

A depraved sexual appetite has been mentioned as accounting for the presence of many foreign bodies. It is known that sexual orgasm may be excited by stimulating the reflex power of the rectum, and it is probable that at the moment when the orgasm is at its height the body used to produce it is allowed to escape from the hand and is lost within the bowel. This is a habit which will never be acknowledged by its victims, but which may often be assumed to exist by the surgeon in depraved patients. The bodies used for this purpose are generally smooth, long, and round, such as glass bottles and pieces of wood. The following case is one in point, and the age of the patient is suggestive, for this vice is said to be more common in old men than in others—men whose physical powers have not kept pace with their desires.

"On the afternoon of March 1st, 1848, a young man consulted Parker with regard to his father, whom he had brought into the hospital. After beating around the bush and manifesting considerable shame and embarrassment, he stated that his father, named Loo, who was sixty years old, had passed the previous night in a house of prostitution. Overcome by drink and opium, the old debauchee conceived the strange notion of pushing a goblet, two and a half inches in diameter and three and a half inches long, into the vagina of his partner. During the night, while Loo was completely intoxicated, the woman attempted to revenge herself. She carefully introduced the bottom of the goblet into the rectum, placed the end of the opium pipe, which was a foot and a half long, into the goblet, and pushed it into the rectum. The goblet disappeared and had been retained twenty-four hours. A piece of the edge, about half an inch long, had been broken off by the friends in attempts at extraction. The glass was firmly fixed, and it was very difficult to pass the finger between it and the rectum. Parker, determining to break it, employed a cephalotribe and removed it in pieces, taking care to protect the parts with cotton. The most difficult part was the extraction of the glass, which was very irritating.

[1] "Mém. de l'Acad. de Chirurgie."

It was done, but not without difficulty, by making it see-saw from side to side. Considerable hæmorrhage occurred, which was arrested with sulphate of copper and alum. The man recovered in two weeks."[1]

It would be interesting to enumerate the foreign bodies which have been removed from this part of the body, and the list would be startling from the strangeness of the different articles; but enough has been said to indicate that almost anything, from a conical stone to a club or a coffee cup, may be encountered by the surgeon, and to indicate the size of the body which the sphincter will allow to pass. Among them may be mentioned beer glasses, mushroom bottles, wooden pepper boxes, wine bottles of all kinds, lamp chimneys, and a part of the wooden handle of a baker's shovel twenty-two centimetres in length.

A foreign substance may remain in the rectum for a considerable time and finally be expelled spontaneously, as in the following case reported by Weigand.[2]

"A farmer, aged sixty-eight years, of a robust constitution, but somewhat stupid, introduced into the anus a cylindrical piece of wood for the purpose of relieving his obstinate constipation. However, he performed the manipulation so unskilfully that the piece of wood broke and remained partly within the rectum. All attempts made to remove the foreign body failed; two days later he suffered from abdominal and lumbar pains, dysuria, and constipation. Weigand, being consulted by the physician, recognized the symptoms of enteritis. As the introduction of a finger into the rectum did not demonstrate the presence of a foreign body, he restricted himself to combating the inflammatory symptoms and pain (calomel, enemata, narcotics, leeches). On the eleventh day a purulent, sanguinolent, fœtid fluid was evacuated, after which the patient felt remarkably relieved; but it was impossible to discover any trace of the piece of wood. Weigand then expressed serious doubts as to whether a foreign body was really contained in the rectum; but as the patient resolutely maintained that he continued to feel the piece of wood, renewed search was made, until the finger, being introduced far in, encountered a rough, hard object which it was impossible to seize for want of proper instruments. As circumstances did not indicate a necessity for more active treatment, Weigand contented himself with giving the patient from

[1] Am. Journal of the Medical Sciences, 1849, p. 409.

[2] Schmidt's Annalen, 113, iv., p. 95, 1862.

time to time two or three spoonfuls of castor oil, which always produced the discharge of a small amount of muco-sanguinolent fæces. At this time the lumbar and abdominal pains again appeared more frequently, and, on the other hand, the patient's former appetite being gradually restored, he walked about and attended to light domestic duties. On the thirty-first day after the accident, after having taken three spoonfuls of castor oil, he stated that he had an intense desire to go to stool, when, in addition to blood and pus, the piece of wood made its appearance, 0.1357 m. long, 0.027 thick, cylindrical, serrated at the broken end, and roughened on the cylindrical surface; in fact it was the end of a pole with which bean vines are propped. The patient recovered entirely without having been subjected to any further treatment." (Poulet.)

Prognosis.—The prognosis in cases of foreign bodies will depend greatly upon their size and nature. A long body like a piece of wood may go so far up the bowel as to do fatal damage before its removal; and a fragile body like glass may cause fatal injury in the attempt to remove it. Again, the prognosis depends in great measure upon the surgical ability of the one in charge of the case. A little bungling in the treatment may at any moment change a case which promises well into a fatal one. Finally, much will depend upon the length of time during which the body has remained in the rectum; and it is not very uncommon for patients who have met with an accident in the practice of this secret vice to conceal the real nature of the trouble, which they well understand, till they are forced by suffering to confess. In this way a week's valuable time may be lost and a fatal amount of injury be done.

Treatment.—Each case of foreign body must be treated by itself, and besides a few general principles which apply equally to all cases, the surgeon will be left entirely to his own ingenuity. The one guiding principle should be to avoid doing fresh injury in the attempt at removal. Only the smaller and least friable of bodies can be removed without a previous dilatation of the sphincter under ether, and in most cases it will be advisable to incise the anus in the median line down to the tip of the coccyx as a preparatory measure to all treatment. This step will sometimes render a body movable which before was absolutely immovable, and thus open the way for its extraction.

Having opened the way to the body, it may sometimes be removed by passing the whole hand into the rectum and seizing

it. At other times forceps may be used with advantage, and these may be of any shape which seems best to answer the purpose intended, including the obstetric forceps, which have been found useful in many cases. If a bottle has been introduced with the mouth downward, a string may be secured around the neck for the purpose of traction ; but, unfortunately, in almost all cases the position will be reversed. In cases of long bodies the lower end is not infrequently firmly wedged in the hollow of the sacrum—so firmly as to resist all efforts at dislodgment. Under such circumstances fatal injury may easily be done by the operator by persistence in the attempt.

Above all things the surgeon must avoid breaking such a substance as a cup, for experience has proved that, after this has happened, removal without causing great injury is almost impossible.

Certain complications may at any time arise in the treatment of these cases, one of which is recorded by Desault.[1] A man, aged forty-seven years, entered the Hôtel Dieu on April 17th, 1762, in order to have a crockery vessel extracted from his rectum which he had introduced a week previously in order to overcome, as he said, his obstinate constipation. This vessel was a preserve jar, the handle of which was broken and the bottom detached. It was conical in shape and three inches long; it had been introduced by the smaller end, which was two inches in diameter.

When the patient presented himself at the hospital he had already made efforts to extract the foreign body, but an escape of blood and the excessive pains had compelled him to suspend his efforts. The upper part of the rectum was infolded and invaginated in the vessel, and formed a very hard tumor which filled it completely. The surrounding parts were inflamed, and this fact rendered the extraction more difficult. Desault made the patient lie upon the side, and then, separating the intestine from the walls of the vessel, he succeeded in seizing the latter with a strong extractor, which he pushed up as far as possible, and which was held by an assistant. By means of this point of support, and with another extractor introduced in the same manner, he succeeded in breaking the vessel and in extracting it in small pieces without wounding the rectum. The operation was neither long nor painful, though it was necessary to introduce the extractors a large number of times. After all the pieces had been removed, Desault pushed back the inverted por-

[1] Journal de Chir., t. iii., p. 177. (Poulet.)

tion of the rectum by means of a charpie tampon six inches long and two and a half in diameter, which he pushed in altogether after having covered it with cerate. Below this were placed a large amount of charpie, several compresses, and a triangular bandage which supported the whole dressing. The dressing was renewed twice a day on account of the relaxation, which did not cease till the sixth day. Then the intestine no longer protruded when the patient went to stool, and such large tampons were not required. They were discontinued entirely after the tenth day, when the ruptures had cicatrized, and the man left the hospital entirely cured two weeks after the operation.

In cases where a long body has become firmly wedged into the lower end in the hollow of the sacrum, the proper treatment consists in opening the abdomen, and this should be done after an attempt to remove it *per anum* has been continued a reasonable time, and before injury has been done in such an attempt. It is not necessary to describe the operation of laparo-enterotomy in this connection. The incision may be made either in the median line or in the groin. In the "Surgical History of the War of the Rebellion," vol. ii., p. 322, there is a history of one such operation performed upon a sailor who had introduced a stone five and a quarter inches long by three wide. The colon had been perforated, and the stone was removed from the peritoneal cavity by an incision near the umbilicus. The man recovered. The oldest known case[1] was reported by Réalli in the *Bull. de Soc. Médich.* and *Gaz. Méd.*, July, 1851, and, being the one which has served as a guide for all subsequent ones, we give it in full :

Case.—*Foreign Body.*—"On December 18th, 1848, a peasant was brought to the hospital of Orvieto in a condition of extreme weakness. Nine days previously, having hit upon the ingenious idea that if he prevented the discharge of food he could limit the quantity to be swallowed, he introduced a piece of wood into the rectum; all his attempts at removal only served to push it in still further. The finger could only touch the end of the object, and it was firmly fixed in such a manner as not to yield to any tractions which could be made upon it with such a slight purchase.

"After the failure of all attempts at removal, the foreign body completely obliterating the intestinal cavity, and the pa-

[1] For this and many other interesting facts in connection with this subject the reader is referred to Poulet's work on "Foreign Bodies in Surgery," Wood's Library of Standard Medical Authors, 1880.

tient being threatened with death from his atrocious sufferings, Réalli decided to operate. After having cut the abdominal walls on the left side, he could distinctly feel the stake in the descending colon. He desired to push it down to the anus, but the attempts proved unsuccessful, and he was compelled to incise the intestine. Only after this was done could he remove the body, which was ten centimetres long and more than three centimetres in diameter at the base. The point was rounded and very soft. No fæces were retained above the plug, but the mucous membrane was blackish, the peritoneal coat strongly injected, and the thickness of the intestinal wall markedly increased.

"The wound in the intestine was united by a suture, which was applied according to Jobert's plan. The lips of the wound in the abdomen were united by means of an interrupted suture. Cold and then iced applications were made over the operated region. Two doses of castor oil were administered. There was a purulent discharge from the anus. During the first few days the tumefaction of the walls of the intestines prevented the advance of fæces, and caused meteorism and vomiting. Three bleedings, two applications of leeches, and a few doses of castor oil put an end to these symptoms, which had acquired an alarming character. The evacuations from the bowels were again passed on the fifth day. Toward the fourteenth day the wounds had cicatrized. Two years later the health remained perfect."

In a paper read before the Soc. de Chirurgie,[1] Studsgaard, of Copenhagen, reports the following similar case:

Case.—*Foreign Body.*—"J. F., footman, aged thirty-five years, was admitted on January 10th, 1878, to the Copenhagen Hospital, and left cured on April 16th, 1878. The night before entering he had introduced an empty mushroom bottle into the rectum, the neck of the bottle being uppermost, in order, as he stated, to relieve a rebellious diarrhœa, and on the morning of January 10th he was obliged to call a physician, acute pains being experienced in the abdomen.

"He was anæsthetized with chloroform, but the bottle, which, previous to the narcosis, had been felt in the rectum, slipped further up. He was exhausted by the passage and the increasing pains; vomiting of mucus. The bottle could be felt through the somewhat tense abdominal wall along the median line on the left side, the bottom being near the horizontal ramus

[1] Bull. de la Soc. de Chir., 1878, p. 662.

of the pubis. In the evening, profound narcosis and posterior linear rectotomy ; the hand was introduced as far as the third sphincter, which was not forced, on account of its resistance. The bottle was then pressed from the outside down into the pelvis, but it descended in a loop of the intestine in front of the rectum. Immediately afterward antiseptic laparo-enterotomy through the median line, by an incision ten centimetres long, commencing at the umbilicus. A loop, which was thought to be the sigmoid flexure, was extracted, and the bottle was then slowly removed through an incision four centimetres long, which was made upon the orifice and upper part of the neck. The entire circumference was protected by sponges and compresses between the fæces, and the intestinal incision was closed by twelve to fourteen catgut sutures according to Lembert's method, the peritoneal surfaces having been freely washed. In order to be on the safe side, the sutures were tied with three knots ; the intestines were then introduced, and the abdominal wound united with eight silk sutures tied alternately with knots and the figure of eight. The operation lasted an hour.

" The bottle was seventeen centimetres long, the diameter of the bottom was five centimetres, that of the neck three centimetres ; the opening contained a notch, which was evidently of old date, about half a centimetre long and presenting cutting edges. The recovery occupied a long time, and the prognosis was uncertain for a very protracted period, on account of a local peritonitis with abscess formation, which I incised both upon the median line and through the rectum, upon the posterior wall of which it projected. Gas began to pass two days after the operation ; from the ninth day on, he had spontaneous evacuations, which were well formed and contained no traces of pus."

One other case of this kind has been placed on record [1] by Verneuil.

Case.—A man, aged forty-five, had been in the habit of stopping up his rectum to overcome an incontinence of fæces which had resulted from two previous attacks of dysentery. For this purpose he used various large bodies, taking the precaution to tie to them a piece of cord, the ends of which were left hanging outside. But one day he had no cord, and a cylindrical piece of wood, ten centimetres long and about eight in diameter, escaped into the upper part of the rectum and could neither be forced down nor reached with the finger. All the

[1] Prog. Méd., May 15th, 1880.

efforts which were immediately made by a physician of the place only forced the body further from the anus.

In this condition the patient entered the service of M. Verneuil. There were few signs of retention, but the finger could not be made to reach the foreign body; only with the hand on the abdomen could it be felt in the left iliac fossa. It was so high that linear proctotomy could give no assistance, and therefore laparotomy was decided upon. The plan of operation was the following: Through a small abdominal incision to search for the sigmoid flexure, in which the body was probably lodged; to draw the sigmoid flexure outward, and, if healthy, to incise it, remove the body, sew up the gut and replace it in the abdomen. If, on the contrary, it was diseased, to stitch it to the abdominal wall and make an artificial anus. But the foreign body was so fixed in the upper part of the rectum, with its long axis from behind forward, as to be immovable, and by reason of this immobility of the rectum the former plan of operation had to be abandoned.

Fortunately, it was possible to dislodge the body from this fixed position, and M. Lucas Championnière, who at that moment practised the rectal touch, received it upon the end of his finger. While an assistant fixed the body by pressing on the abdomen, M. Verneuil endeavored to seize it with the forceps of Muzeux or to fit it with a gimlet, but without success. Linear proctotomy was then resorted to, and M. Verneuil succeeded in moving the body with one of the blades of a lithotomy forceps, bringing it down, and seizing it with another pair of strong forceps. The instrument slipped many times on the bark of the wild-cherry wood, and it was only after many long and painful attempts, practised with a very defective stock of tools, that the foreign body was finally withdrawn. It was followed by a discharge of very fœtid fæcal matter and a little blood. The result of the operation, thanks to the precaution taken during the manœuvres and the treatment subsequently employed, surpassed all expectations. The abdominal wound healed by first intention under Lister's dressing, and a soft-rubber catheter, kept permanently in the rectum, through which chloral was injected every two hours, prevented any complications in that part.

Case.—*Removal of a Stone from the Peritoneal Cavity; Recovery.*[1]—John S., sailor, aged forty-one, had been in the habit of crowding either a belaying pin or an eight-ounce bottle into the

[1] "Boston City Hosp. Rep.," 1882.

rectum to relieve a retention of urine, which was of a spasmodic nature, and which recurred frequently. June 13th, 1870, not having any bottle, he obtained a pebble, five inches long by three

Fig. 167.—Stone removed from Peritoneal Cavity. Natural size.

in width, and weighing two pounds, and, having greased it, he applied it to the anus and sat upon it. Suddenly the stone slipped into the rectum above the sphincter, and although the

patient could touch he could not remove it. A physician was called, who endeavored to pull it out with wire loops, but the more he tried the farther the stone receded from the anus. A

FIG. 168.—Stick removed from Rectum. Natural size.

final effort was made by causing the captain's boy to pass in his hand "up to the shoulder"; he could reach the pebble, but could not draw it down. The patient was then brought to Bos-

ton, and Dr. Thorndike called June 15th. He found him suffering from peritonitis, indicated by tympanites, pain, high pulse and temperature, vomiting, and brown tongue. The patient having been etherized, Dr. T. passed his hand into the rectum; he could feel the stone high up in the abdominal cavity, but his hand and arm were so cramped by the want of space that it was impossible to seize the foreign body. An incision, five inches long, was then made, parallel with the outer border of the left rectus muscle, extending upward to a point two inches above the umbilicus; the peritoneal cavity was opened, and the stone found lying among the intestines just below the stomach. (Fig. 167.) The bowels were highly congested, but not adherent to each other. The aperture through which the stone escaped from the intestine was about eight inches above the anus. The external wound was closed with six silk sutures.

"The patient had a thin, yellow dejection three days after the operation. No blood ever came from the rectum. The vomiting, hiccough, tympanites, and pain gradually subsided, and he got out of bed in twelve days."

Fig. 168 represents a willow stick introduced by the patient five years before "to relieve constipation." A recto-vesical fistula had been formed, and the stick had become encrusted with phosphates.[1]

These five cases indicate with sufficient clearness the general rules which should guide the practitioner. The operation is applicable only to bodies high up in the rectum. The point of incision may be in the median line, over the sigmoid flexure in the left loin, or over what seems to be the most prominent point of the foreign body, wherever that may be. If the intestine is healthy, it may be closed and returned into the body; if not, an artificial anus should be made at the point of incision.

It is worthy of note that all of the cases thus far recorded have ended in recovery.

Note.—Other cases of this sort are as follows:

Russell, G.—Case of intestinal obstruction caused by a wine bottle; removal by abdominal section; death. British Medical Journal, May 28th, 1881.

Gentilhomme.—Corps étranger du rectum déplacé et arrêté dans l'S iliaque; extraction par l'abdomen, suture de l'intestin; guérison. Union Méd., Septembre, 1881.

Billroth.—Foreign body in the sigmoid flexure; laparotomy; enterorrhaphy; death. Wiener Med. Woch., Nos. 3, 5, 7, 1881. In this case the foreign body (a pencil seven centimetres long) had been in the body three weeks, and the patient was in collapse from perforation at the time of the operation.

[1] Crummer, Omaha Clinic, October, 1888.

CHAPTER XVIII.

SPASM OF THE SPHINCTER—NEURALGIA.

Spasm of the sphincter without the presence of any other rectal affection is undoubtedly rare. Its general character may perhaps best be shown by the citation of the following cases.

Case.—*Spasm of the Sphincter.* — Physician, aged twenty-eight. The patient was a man decidedly given to thinking about his own health, and though generally well, not at all robust. He came to me complaining of a sense of discomfort about the rectum, accompanied by difficulty in defecation. The discomfort seldom amounted to actual pain, and he had noticed that when he was away on his summer vacations he was always better and in fact perfectly well. Nevertheless the trouble in defecation had increased so markedly during the past few months that he was fully convinced that he was suffering from actual stricture.

An attempt at digital examination caused the most exquisite suffering, forcing the patient to cry out in agony, and yet there was entire absence of any lesion.

The treatment was based upon the fact which he had himself noted, that when his general condition was improved the local trouble ceased; and the patient was cured by purely general measures looking toward the building up of the system.

Case. — *Spasm of the Sphincter.* — Professional man, aged thirty. In this case also the only symptom complained of was pain on defecation, sometimes severe, sometimes slight. The history given pointed so strongly toward the existence of a fissure that I etherized the patient, fully expecting to cure him by stretching the sphincter. He was entirely cured by stretching the muscle, but, to my surprise, a most careful examination revealed no disease; and, being dubious myself about the existence of spasm without fissure, the examination was a very thorough one. This patient was also a man of sedentary habits and of rather a nervous character.

The following case is taken from Syme, and is characterized

by him as a remarkable instance of the affection :[1] "I was asked to see a gentleman, about sixty years of age, who stated that a few weeks before, after sitting out a long debate in the House of Commons, he had felt extreme difficulty in evacuating the bowels, having previously for several years experienced more or less uneasiness from this source ; that he had consulted a physician and surgeon in London, who prescribed laxatives without affording relief ; and that his complaint had continued so as at length to confine him to bed. I proposed an enema, which was at once objected to on the ground that the anus would not admit the smallest-sized tube. Suspicion being thus excited, the anus was examined and found to present the characteristic features of spasmodic stricture. Having explained my views of the case, I gently insinuated the narrow sheath of a *bistoury caché*, which I happened to have with me, and then expanding the blade, withdrew it so as to make an incision on one side of the orifice. A copious stool immediately followed, and the patient was at once completely relieved from his complaint."

With regard to this much-disputed affection, a citation of authorities may be useful. Syme[2] believed that spasm existed as an independent condition without morbid change; that, though there could be no doubt that spasm and fissure frequently existed together, it was not reconcilable with the facts met with in practice, that spasmodic stricture was always of secondary origin and dependent upon the fissure. He says: "In a considerable number of cases I have found the sphincter firmly contracted without any perceptible fissure or abrasion of the surface."

Mayo describes spasm of the sphincter as a kind of cramp which often comes on suddenly, sometimes at night during sleep. The paroxysms may occur daily or two or three times a year ; and the attack may come gradually and cause uneasiness for two or three days, and then pass away, or its coming and going may be sudden. He says : "There are cases in which the disease produces long-continued and permanent suffering ; in which the anus becomes permanently contracted and hardened, constituting, therefore, a permanent stricture, and generally combining both permanent and spasmodic contraction. The motions are passed with an effort and with pain, and all the common symptoms of stricture of the rectum are present."

[1] "Diseases of the Rectum," Edinburgh, 1838, p. 138.

[2] Loc. cit., p. 134.

Allingham[1] says: "Spasm of the sphincter has been said to be the cause of impaction, but I have more often thought the reverse was the case, and the impaction the cause of the spasm. I must, however, acknowledge that spasm is often the cause of the constipation which is the forerunner of impaction. In impaction, spasm of the sphincter always exists; in some instances to such a degree that, when the patient strained, I have observed the anus protruded like a nipple, and an injection returned in a fine stream as if coming out of a squirt. I have certainly met with cases of idiopathic spasm of the sphincter, usually in elderly, nervous single women, and though no impaction was present, costiveness was."

Quain[2] concludes that "where pain, brought on by fæcal evacuations and continuing after them, happens to be present, the fault—the morbid condition—is not in the sphincter, but in the skin or mucous membrane covering it, and that the division of the muscle is not required in order to remove the patient's suffering." In other words, that spasm is always dependent upon fissure. Boyer[3] treats of "constriction with fissure" and "constriction without fissure."

Dupuytren[4] says: "The gravity of this affection (fissure) depends chiefly on the painful spasm of the sphincters; the fissure is only an accident, as is proved by the existence of painful spasm without fissure, which, according to well-known surgical authorities, is found in proportion to the other of one to four." And, "the spasmodic constriction is the true lesion, and the fissure only an epiphenomenon." Sir B. Brodie[5] held the same views.

The symptoms of spasm of the sphincter are pain on defecation and for a time after; more or less uneasiness about the anus, especially when sitting; fulness in the perineum; often more or less trouble with the bladder, as shown by frequent micturition, sometimes attended by smarting in the urethra and constipation. The disease is generally attended by exacerbations and remissions. A digital examination of the anus is always painful, and the contraction may be so great as to leave hardly a trace of the anal orifice. Any anxiety or distress of

[1] Op. cit., p. 210.

[2] "The Diseases of the Rectum," London, 1854, p. 167.

[3] "Traité des Maladies Chirurg., etc.," fourth edition, t. x., p. 139.

[4] "Leçons orales de Clinique Chirurg.," t. iii., p. 284.

[5] "Lectures on Diseases of the Rectum," London Medical Gazette, vol. xvi., p. 26.

mind, a generally irritable, nervous condition, and everything which has a tendency to irritate the rectum or the parts around, will aggravate the complaint. It may easily be confounded with the affection next to be described, neuralgia, but is generally distinguishable from it by the marked dependence of the pain upon the act of defecation, which is not seen in neuralgia without spasm.

The treatment consists in attention to the general health of the patient, in allaying any nervous excitement, in the administration of a cathartic to empty the bowel when the spasm is present, and in anodyne injections, such as, for example, twenty drops of laudanum in an ounce of water. Suppositories may cause renewed irritation. Even in the more aggravated form the disease will often yield to such measures as this, but if it does not a cure may always be effected by forcible dilatation of the sphincter under ether. If the patient will not submit to this, the next best thing will be found to be the introduction and retention of a bougie.

Neuralgia.—Neuralgia of the rectum is generally met with in nervous people, especially females, such as are subject to neuralgia in other parts of the body. The following cases show its general character.

Case.—Professional man, aged forty-nine. The patient was slight and pale from sedentary habits, but was generally well. Thirteen months before consulting me he was operated upon for fissure, and after the operation he had for some time been entirely well, but he now has what he describes as a dull, wearing pain in the rectum, coming on while at his daily work, lasting a longer or shorter time, sometimes all day, but generally passing away after he has reached his home and become quiet and rested. He has noticed that the pain has a direct connection with the state of his general health, and that when he is away from his work and rusticating he is entirely free from it. The pain is no greater at the time of defecation than at any other, and is never so severe as to be unbearable. A careful examination of the part failed entirely to show any lesion.

Case.—Woman, aged sixty-five, married. This patient had been treated for fissure, for ulceration, and for coccygodynia, and had refused to submit to excision of the coccyx. Her general health was fair, but there was decided gastro-intestinal disturbance. The pain of which she complains has been present for about eighteen months. She suffers chiefly when sitting, sometimes finds it impossible to lie upon her back, and is apt

to have a sharp twinge when she starts suddenly from her chair. The pain is no worse at defecation, is not increased by pressure upon or movement of the coccyx, and is entirely unconnected with any lesion of the rectum or anus. The greatest sensitiveness to touch seemed to be located well within the sphincter, upon the posterior wall of the bowel. There was enlargement of the womb and misplacement.

From these cases, which are both good examples of mild forms of the affection, it is evident that the disease may vary greatly in its severity. In some persons it will cause the same suffering as the most intense neuralgia elsewhere. The pain is apt to be paroxysmal, but may be continuous, and is independent of the act of defecation. In cases of well-marked periodicity a malarial element should be looked for, and the disease may be a manifestation of the gouty diathesis. In the former case, quinine, and in the latter colchicum, may be of the greatest service. In all other cases the treatment will often be found unsatisfactory, and is to be conducted on general principles. The first care should be for the general health, the second for the regularity of the bowels, and after this local applications of cold water, ointment of belladonna (℥ i.–℥ i.), and blistering over the sacrum may be tried. Besides this local treatment the case must be managed exactly as would be a case of neuralgia in any other part.

The diagnosis from coccygodynia and from spasm must both be made with care.

I have come to be very cautious as to the diagnosis of pure neuralgia of the rectum without first making a careful examination under ether, so many are the lesions which, though difficult to detect and slight in themselves, may cause pain. Those most frequently found will be erosions of the mucous membrane, pockets, and small internal fistulæ.

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